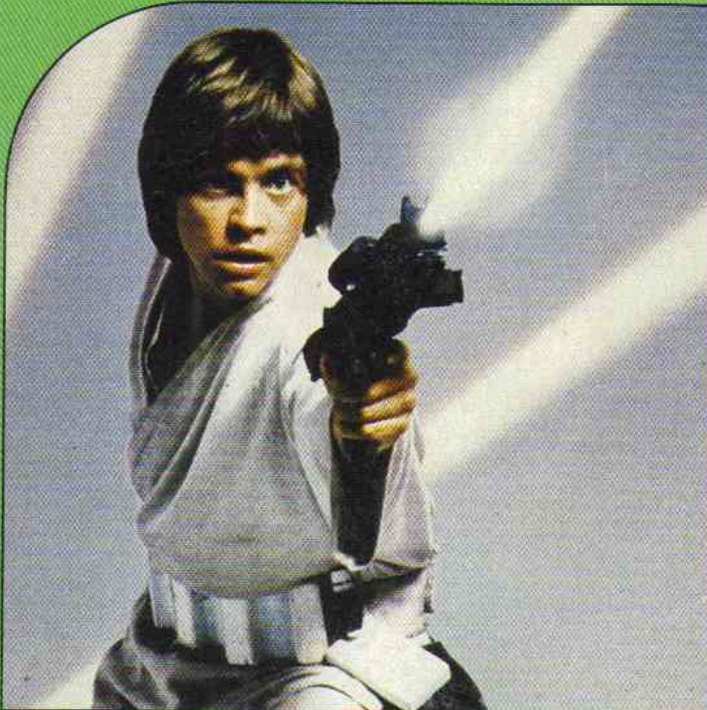


3-2-1 CONTACT

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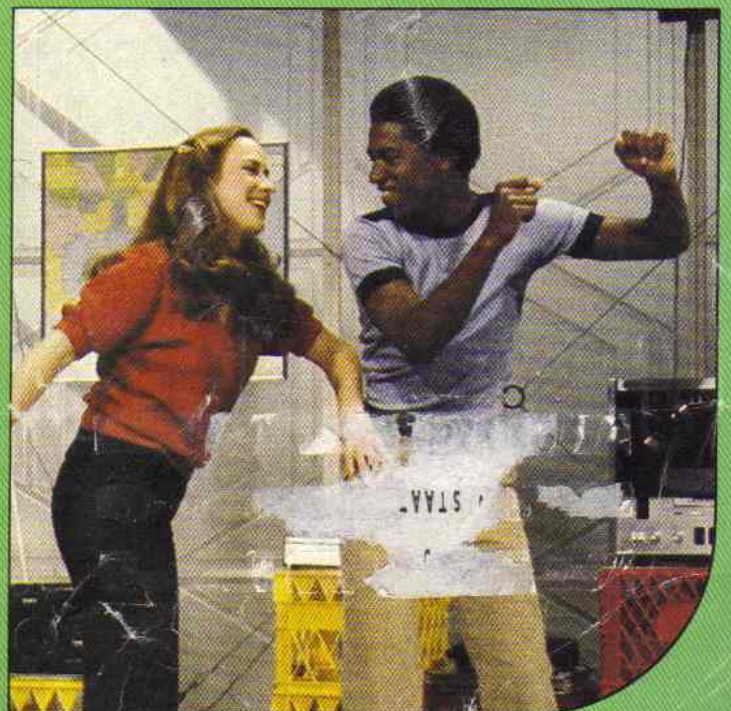
Amazing Movies! Could They Really Happen?



Inside:
3-2-1 CONTACT
Is on TV!
How Do You Pull
a Tiger's Tooth?



Make Your
Own Zoo





Who are these kids, anyway?

If you don't know, it's time to warm up the old TV set. Marc, Lisa and Trini are the stars of our new television show, called 3-2-1 CONTACT.

The show is on five days a week. If you tune in every day, you will find out about all sorts of nifty stuff. But the best news is that you don't have to wait until you are in front of your TV set. Turn to page 17. That's where our 16-page show section, filled with games, quizzes and puzzles, begins.

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AMAZING MOVIES

**COULD
THEY
REALLY
HAPPEN?**

by Gary Gerani

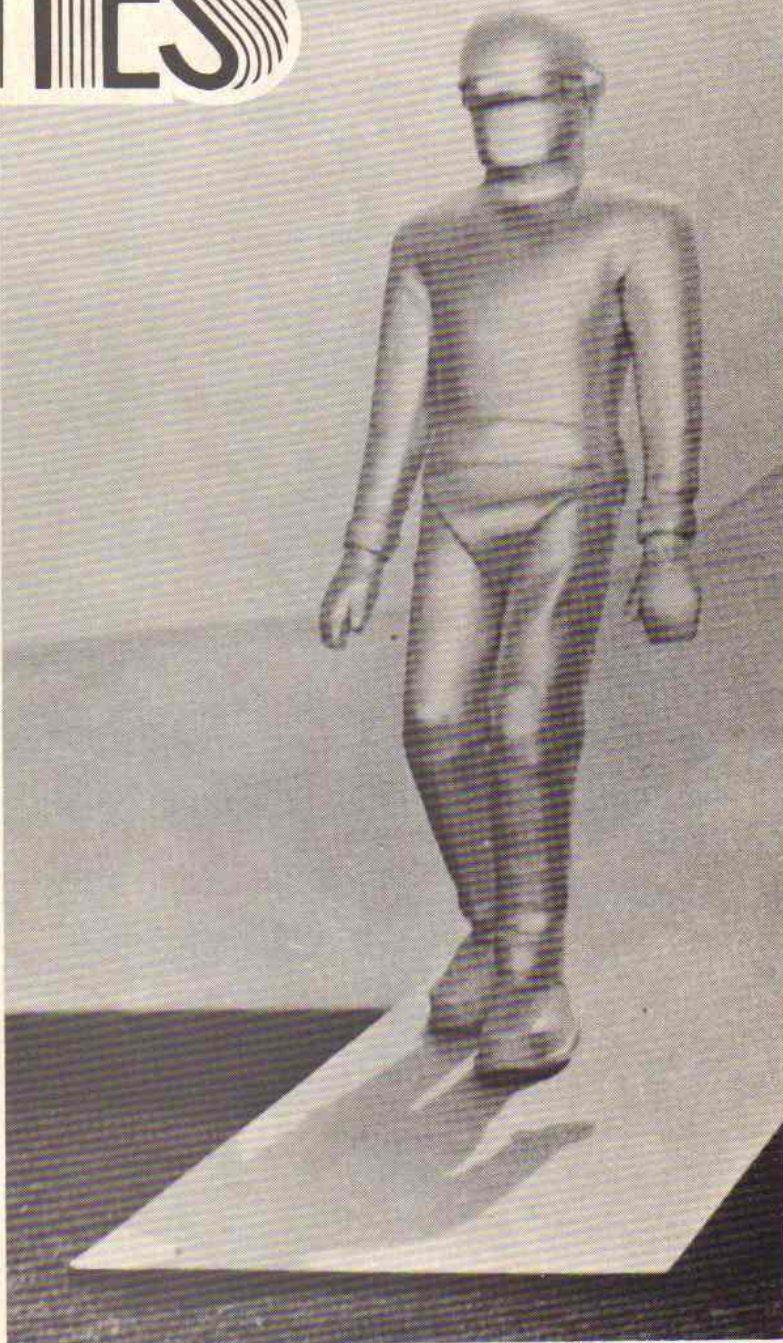
UFO CONTACT

A rocket blasts off for the moon with five scientists on board. Because of an accident, their spaceship is knocked off course. They end up landing on Mars. On the red planet they find a few Martians who are the survivors of a planet-wide war.

That was the story of *Rocketship X-M*, a movie made more than 30 years ago. People who saw the film back then thought of it as science fiction—an impossible story that was fun to imagine.

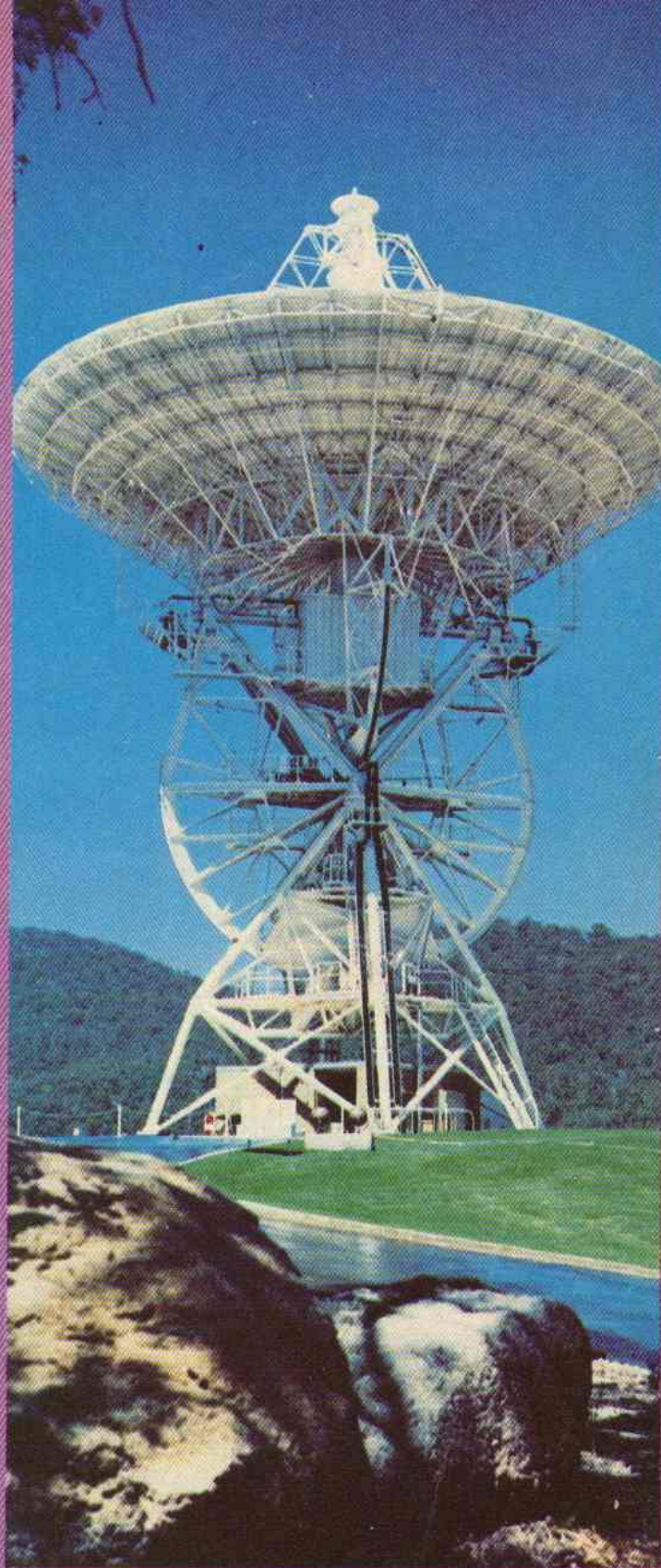
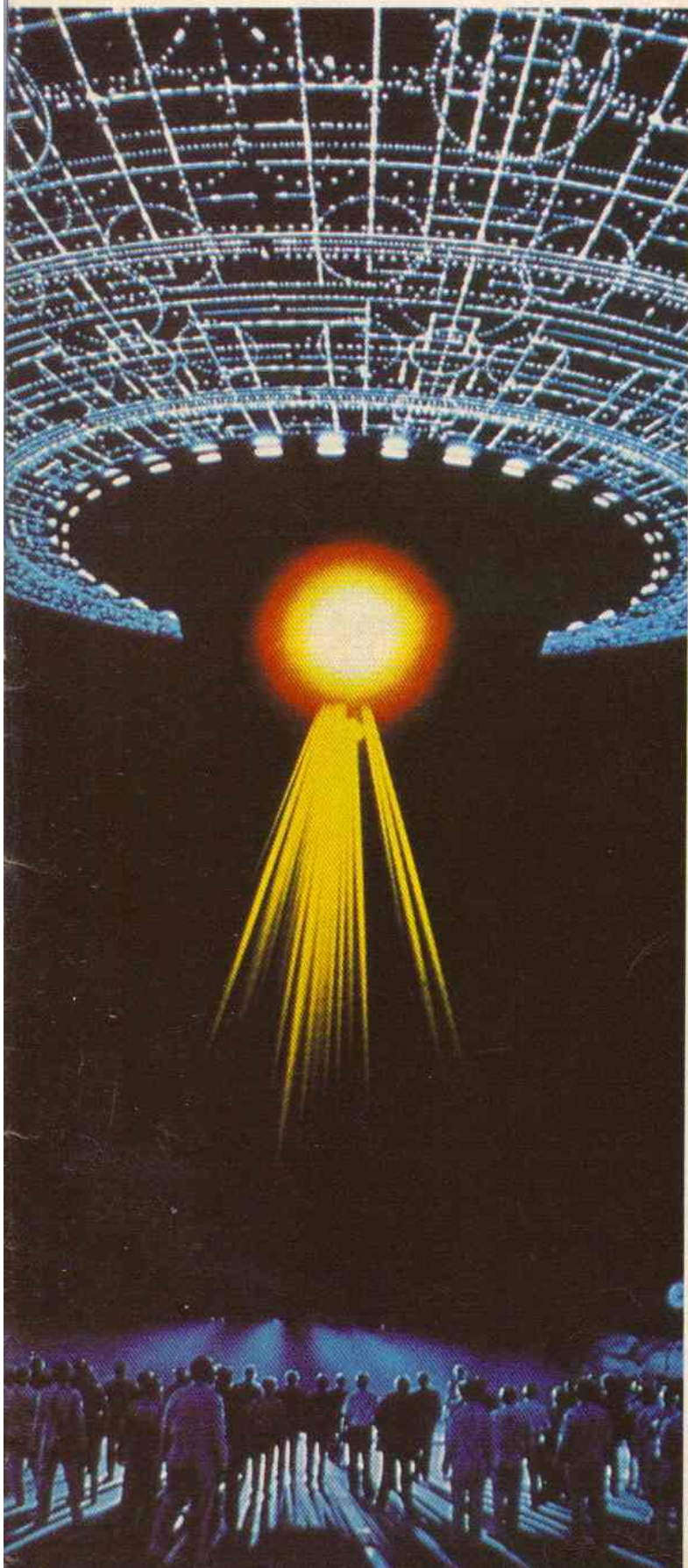
But in 1969, two people really made it to the moon. In 1976 the first rocket landed on Mars. There were no Martians there. But the impossible trip of *Rocketship X-M* seems to be possible after all.

Many things that happen in sci-fi movies end up happening in real life, too. Here are a few more examples of how amazing movies are coming true.



MOVIE! Above: People wonder if there is life in outer space. If there is, how will these creatures communicate with us? In 1951's *The Day the Earth Stood Still*, the answer was simple. A UFO landed in Washington, D.C. On board was an alien and his robot named Gort (seen here). Since the alien spoke English, communication was easy.

MOVIE! Below: In the 1977 movie called *Close Encounters*, the folks from "out there" didn't speak English. Instead they sent messages using the universal language of music. In the movie's spectacular ending, the alien spaceship got into a kind of space concert with Earth scientists below.



REAL LIFE Above: Scientists are looking for ways to make contact with aliens. The best way they've found so far is to send out radio signals. They listen for answers on radio telescopes like this one. If an alien wants to get in touch, it just has to send out the right signal—kind of like an outer space CB!

(turn the page)



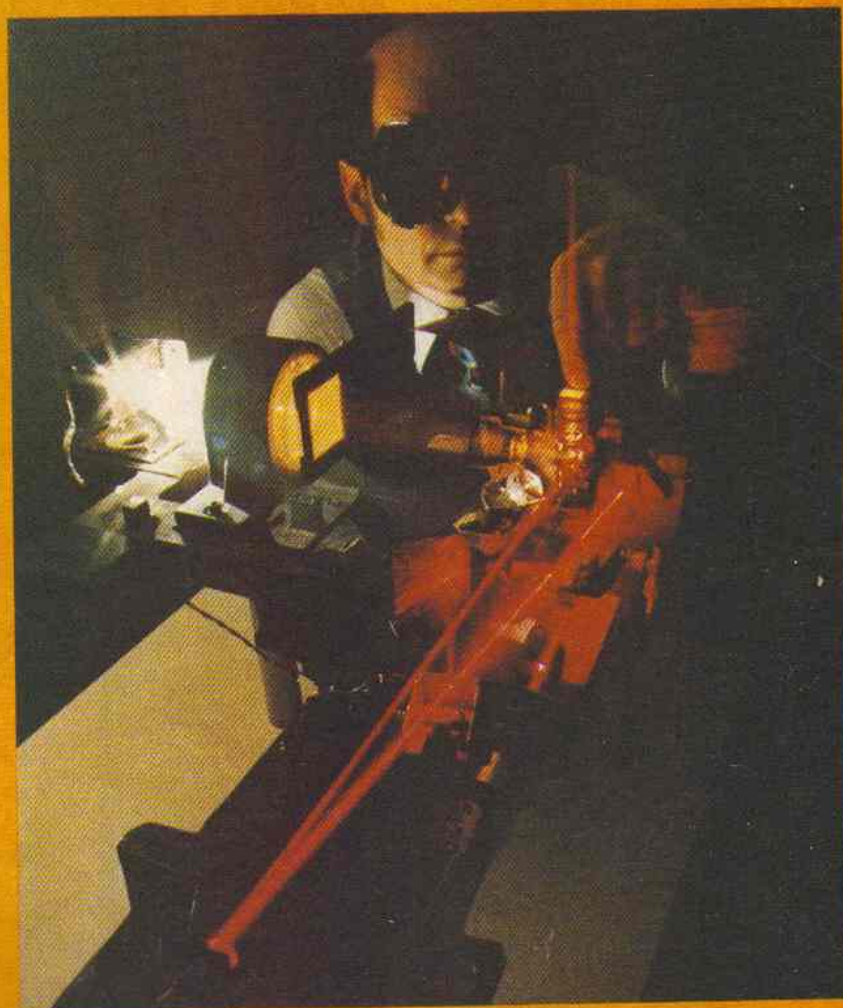
MOVIE! Below: Obi-Wan Kenobi trusted The Force in *Star Wars*. But he also packed a light saber, for added protection. This sword glowed with laser-like light. It was used by Obi-Wan in hand-to-hand-battles.



LASERS

MOVIE! Above: Flashy laser guns, called blasters, are the latest thing for space heroes, as Luke Skywalker proved in *Star Wars*. These colored beams of light aren't just nifty to look at. They can zap bad guys, cut ropes and blast through steel doors, all in just a few seconds.

REAL LIFE Right: Lasers aren't just a moviemaker's imaginary weapon. These powerful beams of light aid doctors in operating rooms, and rock stars in concert. They are now used in everything from satellites to supermarkets. In this picture, a scientist tests the power of a laser used in photography.



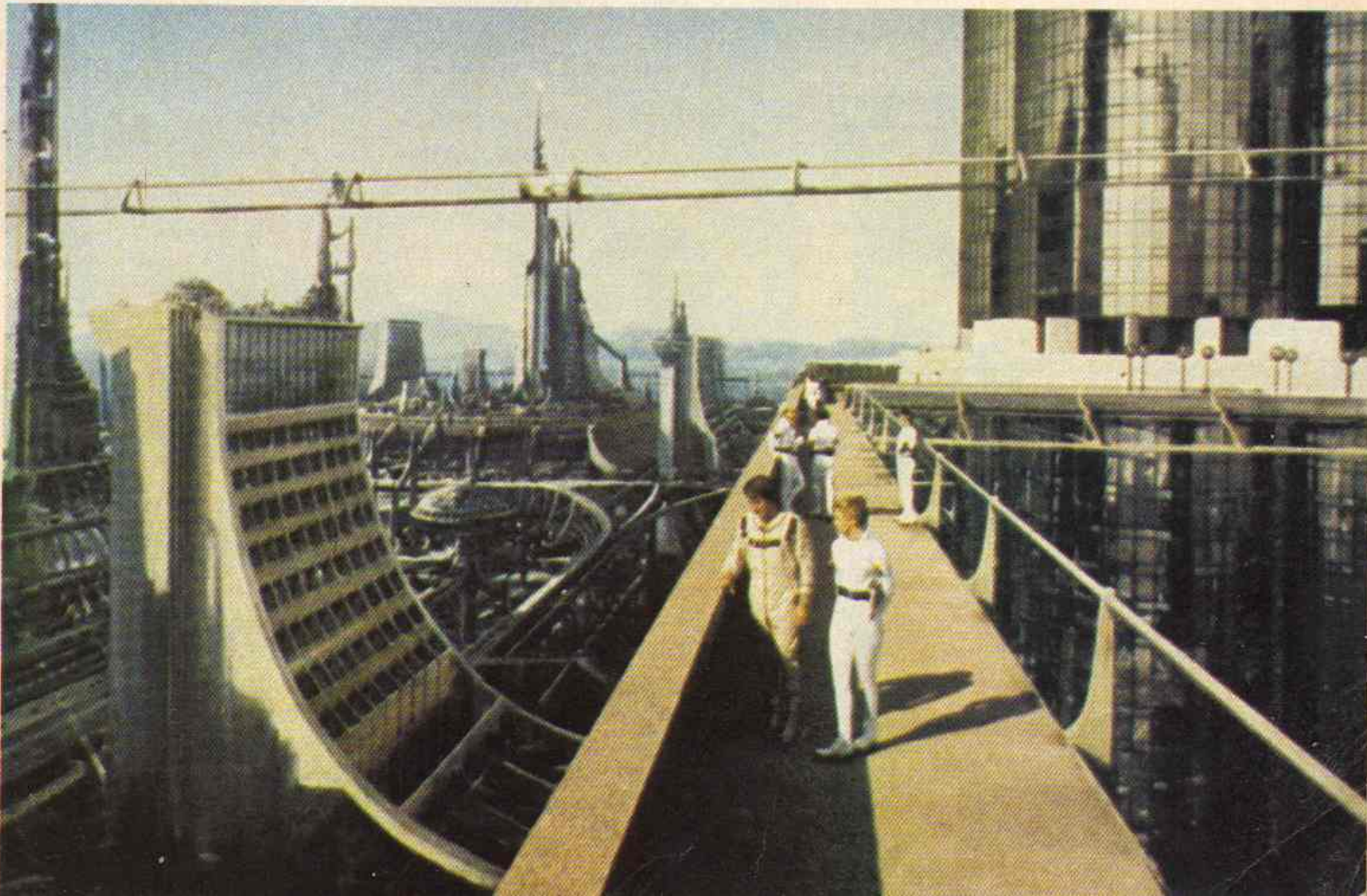
CITIES

MOVIE! Left: What will the city of the future look like? Forty years ago, a movie was made called *Things to Come*. In it, people lived in skyscrapers and traveled in elevators just like today. This whole city was supposed to be underground. The world above had been destroyed by war.

MOVIE! Below: This is the 25th century city of New Chicago, built after old Chicago was destroyed by nuclear war. Though it doesn't look much different than today's cities, it's supposed to be a city of the 25th century. It's the home of Buck Rogers and his friends.

(turn the page)

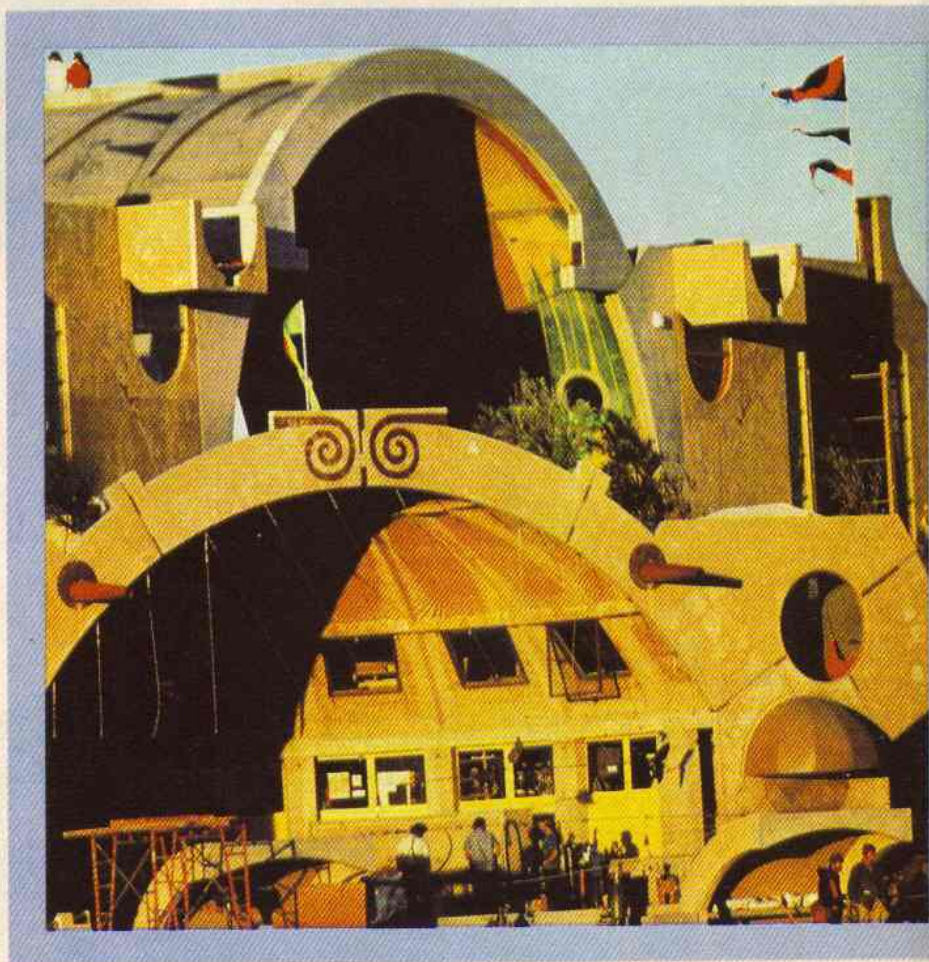
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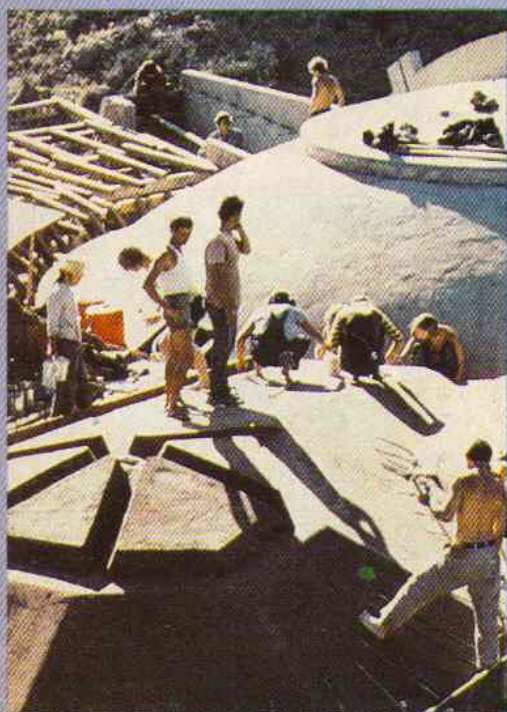


MOVIE! Above: In *Logan's Run*, the year is 2274. You guessed it. The old cities of the world have been destroyed by war. Everyone lives in the city you see here. They are protected from the outside world by a huge dome.

CITIES



REAL LIFE Above and Left: A real city of the future is being built today in the Arizona desert. *Arcosanti* will be a small town within a giant building. People living there will travel by elevator instead of car. Most of the town's energy will come from the sun. In these two pictures, you see students and workers building the first parts of this future city.





New Feature! Starting with this issue, CONTACT will help you collect your own pocket zoo. Next month, six animals of the Arctic will be waiting to warm your pocket.

Pocket Zoo

Animals of Australia by Candace Early

This month all your animals make their home on Australia. This island continent is probably about 8,000 miles (12,872 km.) from where you are sitting right now.

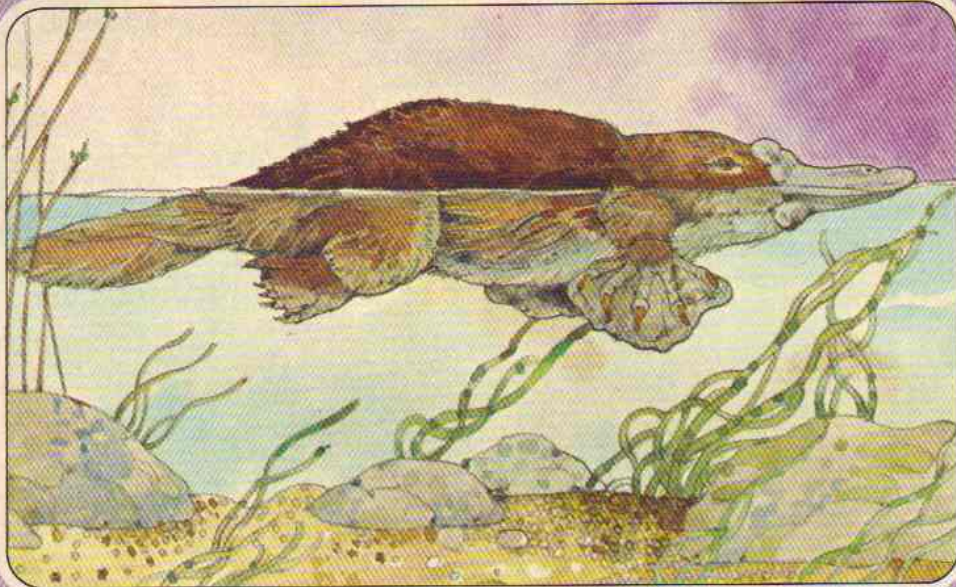
Many of the animals of Australia are unique. They are not found anywhere else in the world. Most of these special animals live in the *outback*. This is the dry desert area that covers much of Australia.

How to Make Your Pocket Zoo

To make your animal cards, you need scissors, 4"x6" index cards (or pieces of cardboard the same size) and some sticky stuff.

- 1.** Cut out your six animal cards along the dotted lines.
- 2.** Paste or tape the animal to one side of the index card. Do this so that the information about the animal *hangs over the side*. (picture below)
- 3.** Now fold the flap with the information so that it is on the back of the card. Glue this side, too.
- 4.** Use the extra space on the back for anything else you might want to write about each animal. Your pocket zoo is ready.





Platypus (PLA-tih-puss)

Scientific Name: *Ornithorhynchus anatinus*

Size: 17½ inches (44 cm.) long.

Weight: 3 pounds (1.4 kg.).

Length of Life: Unknown.

Home: They live in the base of trees near pools of fresh water.

Food: Shrimp, worms and water insects.

Fact: The platypus is one of two mammals known to lay eggs. The babies cut through their eggs with a hook on their duck-like bill called an egg tooth.

Category: Egg-laying mammal.



Koala Bear (ko-AH-la)

Scientific Name: *Phascolarctos cinereus*.

Size: About 2½ feet (.8 m.) from head to toe.

Weight: About 25 pounds (11 kg.).

Length of Life: About 20 years.

Home: They live in eucalyptus trees.

Food: Koalas are picky eaters. Of the 600 types of eucalyptus trees, they eat the leaves of 12 kinds.

Fact: The koala bear is not a bear. Like the kangaroo, koalas carry their babies in a pouch.

Category: Marsupial.



Emu (EEM-you)

Scientific Name: *Dromaius novae-hollandiae*

Size: About 5½ feet (1.7 m.) tall.

Weight: Up to 90 pounds (41 kg.).

Length of Life: About 25 years.

Home: The dry, open fields of Australia's outback.

Food: Fruits, flowers, insects, plants. Caterpillars are a favorite.

Fact: Next to the ostrich, the emu is the biggest non-flying bird. It can run as fast as 36 m.p.h.!

Category: Bird.



Kookaburra

(KOOK-ah-burr-ah)

Scientific Name: *Dacelya gigas*

Size: About 17 inches (43 cm.) from beak to tail.

Weight: About 12½ ounces (353 gm.).

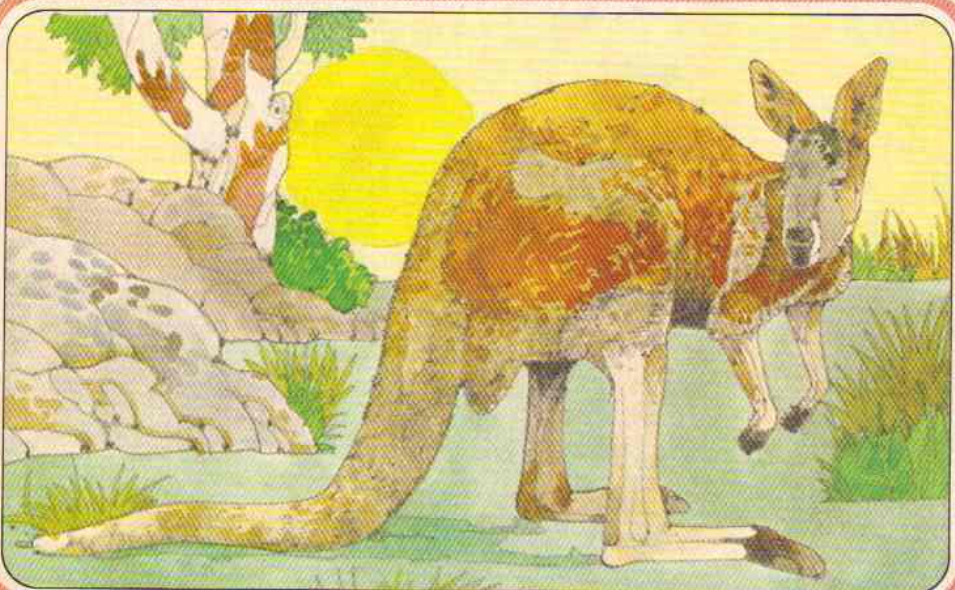
Length of Life: 7 to 15 years.

Home: They nest in holes of trees.

Food: Caterpillars, fish, frogs, insects, small mammals, snakes, worms and small birds!

Fact: The kookaburra makes a sound like a person laughing. It has seven laughs—from a quiet chuckle to a loud cackle.

Category: Bird.



Red Kangaroo

(Kang-ah-ROO)

Scientific Name: *Macropus Rufa*

Size: About 9 feet (2.7 m.) from its nose to its tail.

Weight: Up to 200 pounds (90 kg.).

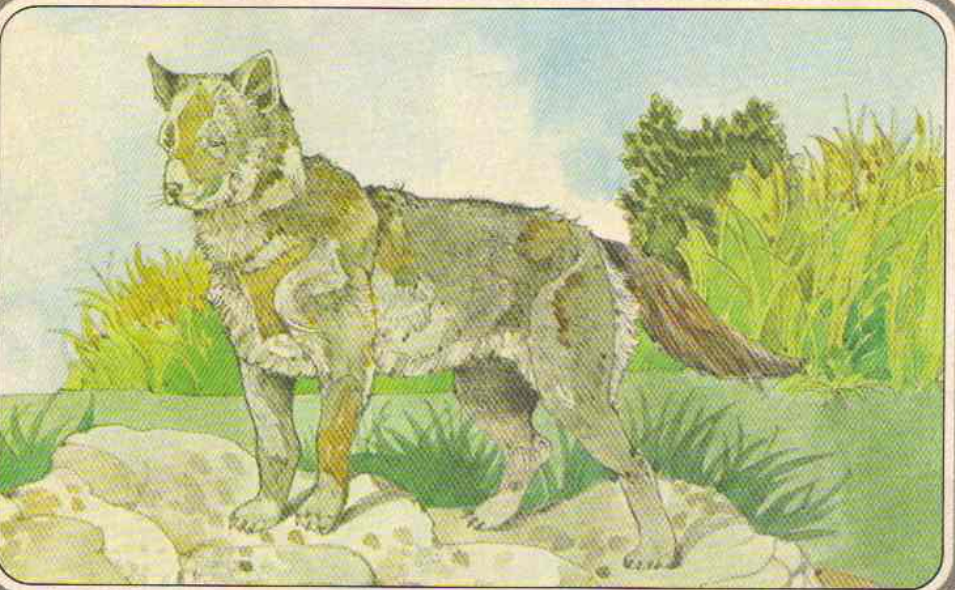
Length of Life: 4 to 12 years.

Home: They sleep all day under eucalyptus trees in the desert.

Food: All kinds of plants. Grass is a favorite.

Fact: The red kangaroo is the best jumper of all kangaroos. It can cover 27 feet (8.2 m.) in a single leap.

Category: Marsupial.



Dingo (DING-oh)

Scientific Name: *C. dingo*

Size: About 2 feet (.6 m.) high.

Weight: 30 pounds (14 kg.).

Length of Life: 9 to 12 years.

Home: The deserts of Australia.

Food: Other animals, including sheep and wallaby.

Fact: The dingo is the only wild dog left in the dog family. Unlike the dogs you know, it does not bark.

Category: Dog.

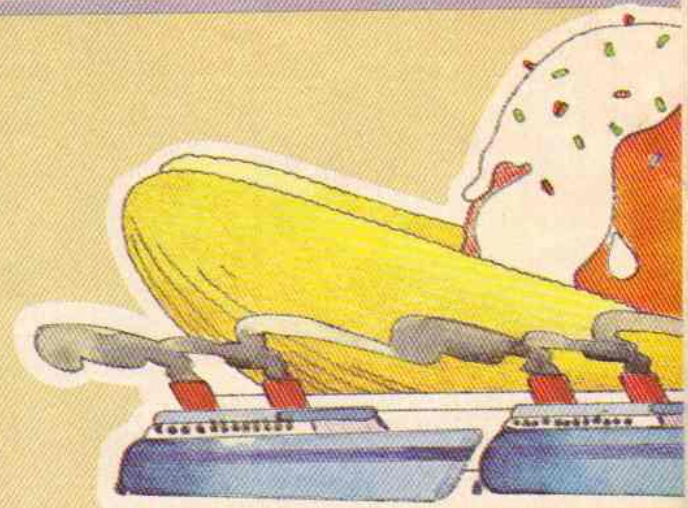
Factoids

What are factoids? They are weird little facts that are stranger than strange, truer than true. Use them to wow your friends, amaze your family and dazzle your teachers.

The largest flying bird is the wandering albatross. Its wings measure 12 feet across.



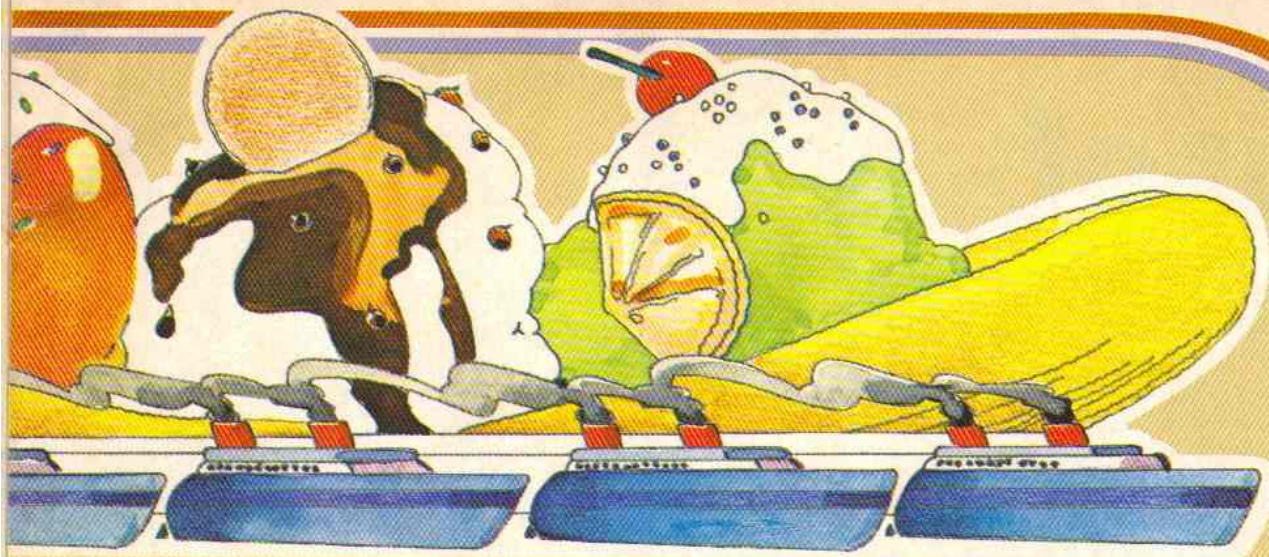
Lightning strikes the earth about 100 times every second.



The longest banana split

There are 2,400,000 Americans named Smith. That's more than any other name.





ever made was one mile, 99 feet long. That's as long as five ocean liners!



Emperor penguins can spend 18 minutes underwater, before coming up for air.



Most adult Americans know about 10,000 words.



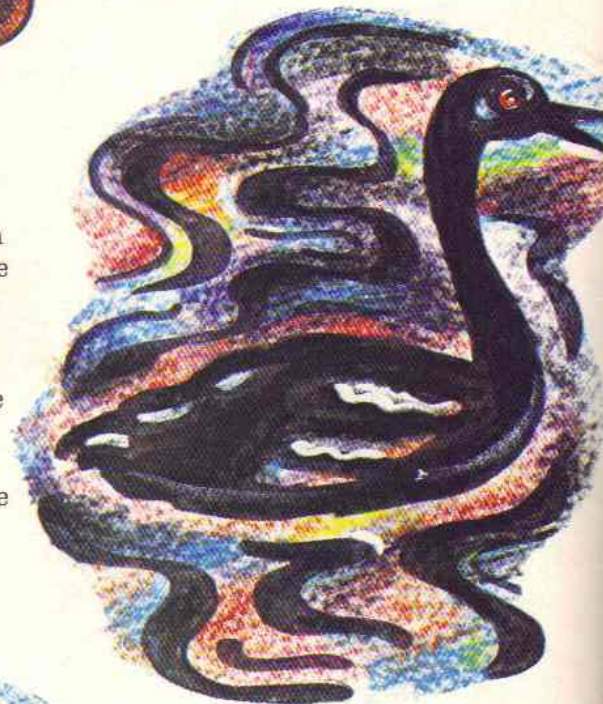
The first bicycle was built in Scotland in 1839.

List of the Month Famous Disasters

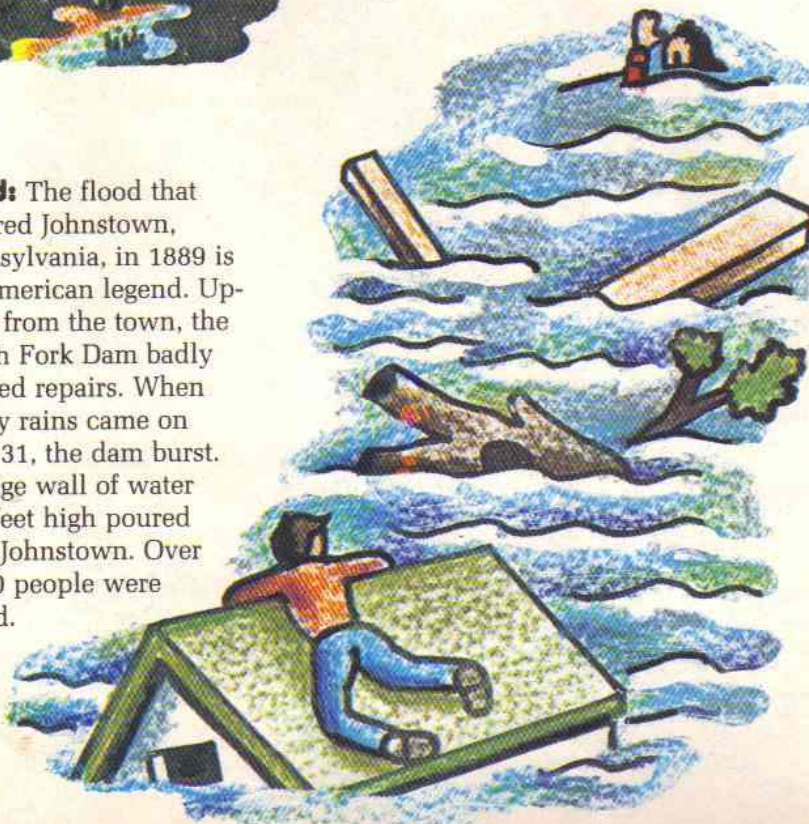


Air Crash: The biggest blimp ever made was the *Hindenburg*. Built in 1936, it was almost three football fields long! Hydrogen gas in the blimp made it float. But this gas caught fire while the ship was landing in New Jersey. The *Hindenburg* exploded. Since then, blimps have been filled with helium gas, which does not burn.

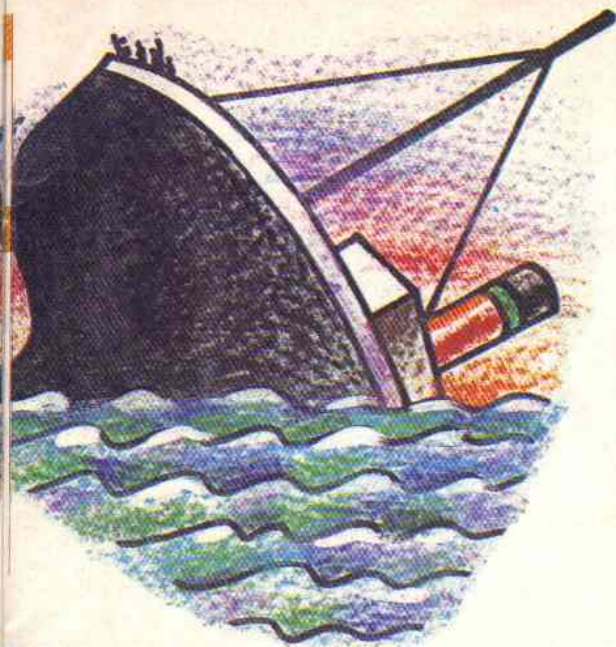
Ship: The *Titanic* was supposed to be unsinkable. But on April 14, 1912, it crashed into an iceberg on its very first trip. There weren't enough life boats to go around, so many of the 2,200 passengers died. Now iceberg patrols sail the Atlantic Ocean to make sure no ship tangles with an iceberg again.



Flood: The flood that covered Johnstown, Pennsylvania, in 1889 is an American legend. Up-river from the town, the South Fork Dam badly needed repairs. When heavy rains came on May 31, the dam burst. A huge wall of water 125 feet high poured over Johnstown. Over 2,000 people were killed.

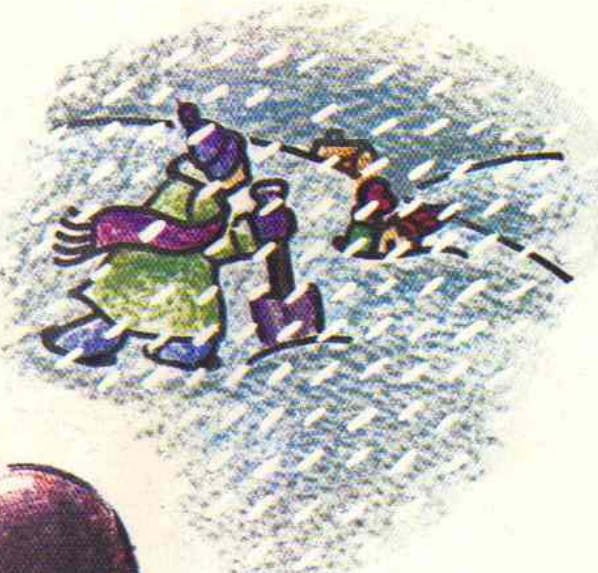
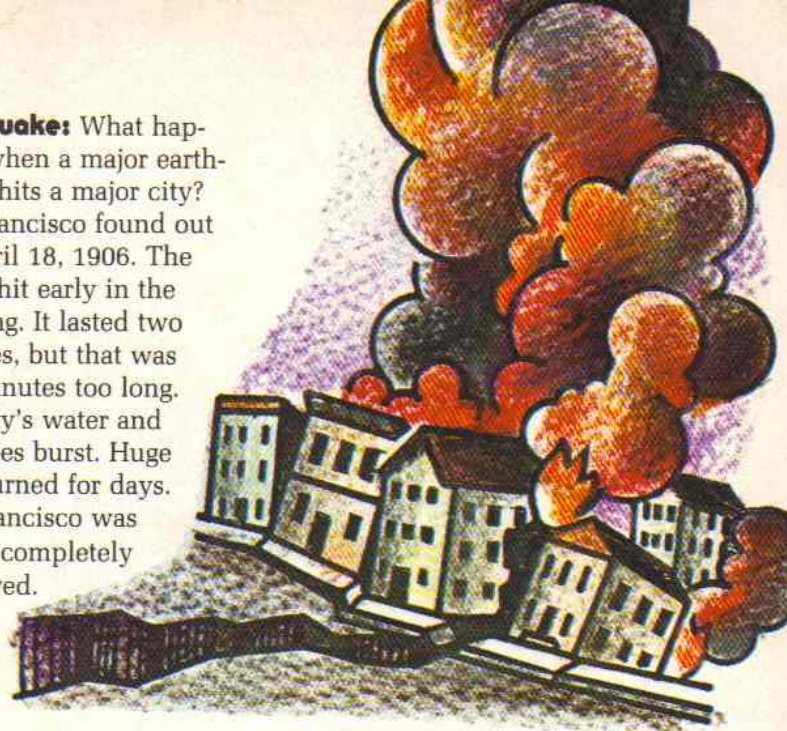


Volcano: On the island of Krakatoa in 1883 a volcano erupted. The explosion was so loud that people could hear it 3,000 miles away! The sky above Krakatoa was black. Lava poured out of the mountain for days. Finally the island collapsed. Most of it disappeared into the Pacific Ocean.

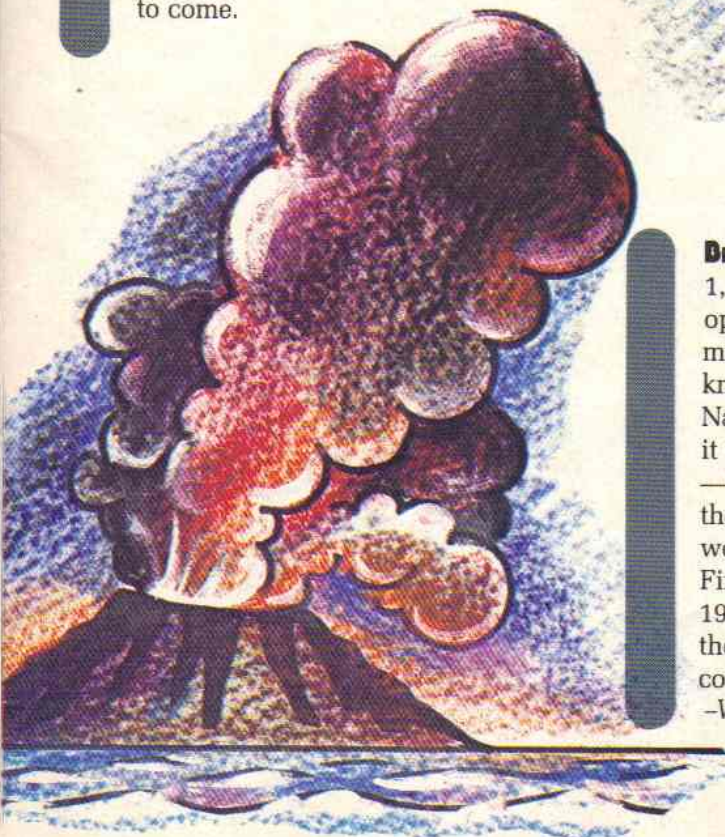


Oil Spill: The worst oil spill so far came from an oil well in the Gulf of Mexico. On June 3, 1979, the well began oozing oil into the water. Out gushed 4,500 tons of oil a day. It sent an oil slick 70 miles long floating towards Texas. Ecologists say that plants and animal life there will be affected for years to come.

Earthquake: What happens when a major earthquake hits a major city? San Francisco found out on April 18, 1906. The quake hit early in the morning. It lasted two minutes, but that was two minutes too long. The city's water and gas pipes burst. Huge fires burned for days. San Francisco was almost completely destroyed.

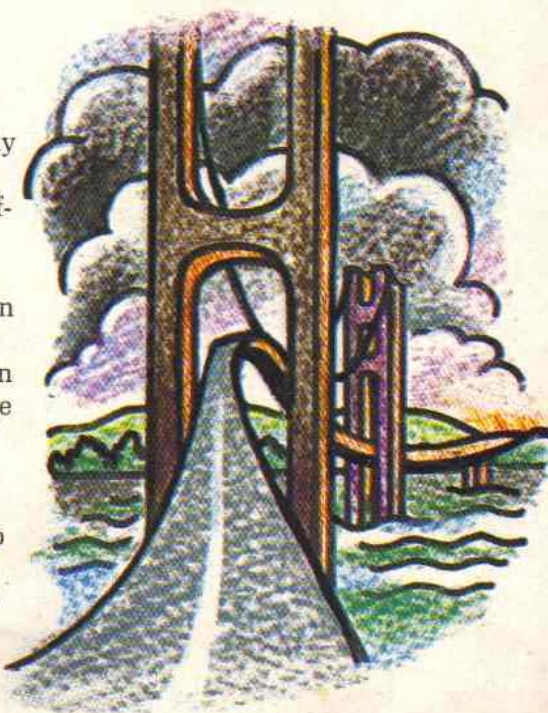


Snowstorm: The "Blizzard of 1888" is one of the most famous snowstorms of all time. It dumped 30 inches of snow and ice on the northeast United States. There were no giant snow plows in 1888. Cities and towns were helpless for weeks. Before the snow melted, more than 400 people died.



Bridge Collapse: On July 1, 1940, a new bridge opened. At first this half-mile-long bridge was known as the Tacoma Narrows Bridge. But soon it was given a nickname—Gallopig Gertie. When the wind blew, the bridge would twist and curve. Finally, on November 7, 1940, Gertie fell. It was the biggest bridge ever to collapse.

—Written by Ellen Weiss



SUNDAY

MONDAY

TUESDAY

WEDNESDAY

Earth Days

Ma

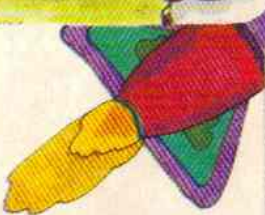
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It's the birthday of Amerigo Vespucci, the Italian explorer for whom America is named. (1451)



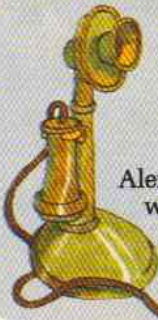
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Dr. Robert Goddard launches the first rocket to be powered by liquid fuel. (1926)



23

Hyman Lipman patents his new invention—the pencil with eraser. (1858)

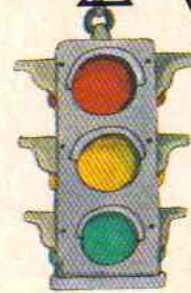


3

Happy Birthday, Alexander Graham Bell, who was born on this day in 1847.

4

Garret Morgan, inventor of the gas mask, belt fastener and automatic traffic light, is born. (1877)



10

Johnny Appleseed Day

11



17



18

A Russian cosmonaut goes for the first walk in outer space. It lasts 20 minutes. (1965)



19

Happy Birthday, Harry Houdini, famous escape artist. (1874)

24

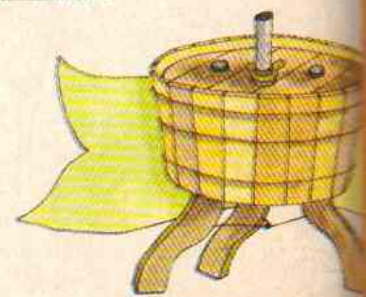


25



Dr. Jonas Salk announces the discovery of a polio vaccine.

31



3-2-1 CONTACT

Blast Off!

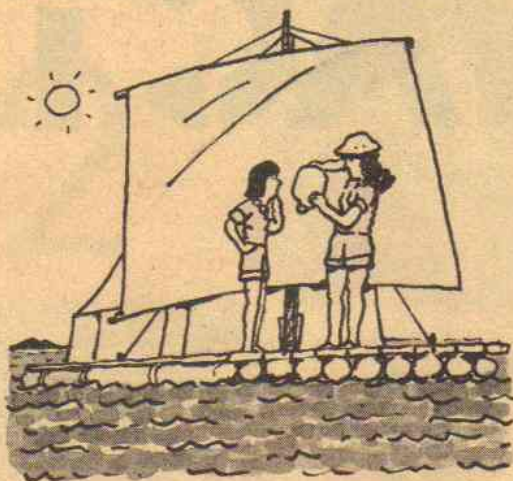
3-2-1 CONTACT is now on television—that's good!
It will only be on for 13 weeks—that's bad!
You can see it five days each week—that's good!
It's only on for a half hour at a time—that's bad!
You can fill in the time with this special pull-out section—that's good!

**Pull this section
out. Put it in a notebook or binder.
Leave lots of room. There's more to
come next month!**

Can You Beat the Heat?

Could you stay warm with no heat or hot water on a freezing day? What would you do if you got lost in the desert? Hot and cold temperatures cause very different problems. Find out how hot your survival skills are by taking this CONTACT quiz.

by Joanna Martin



1. At sea without fresh water

You joined a scientist sailing a raft from California to Hawaii. You're two days from Hawaii when your water runs out. It's July. You know that you'll get really hot without drinking water. What can you do?

- (A) Drink seawater.
- (B) Take off your clothes to keep cool.
- (C) Turn the sail for shade from the sun.
- (D) Wet your clothes with seawater.

2. Lost in the winter woods

A December hike in the woods with your friends is fun until you get lost. A forest ranger will probably find you soon, because a patrol trail runs nearby. But now you can't stop shaking with cold. How can you keep warm?

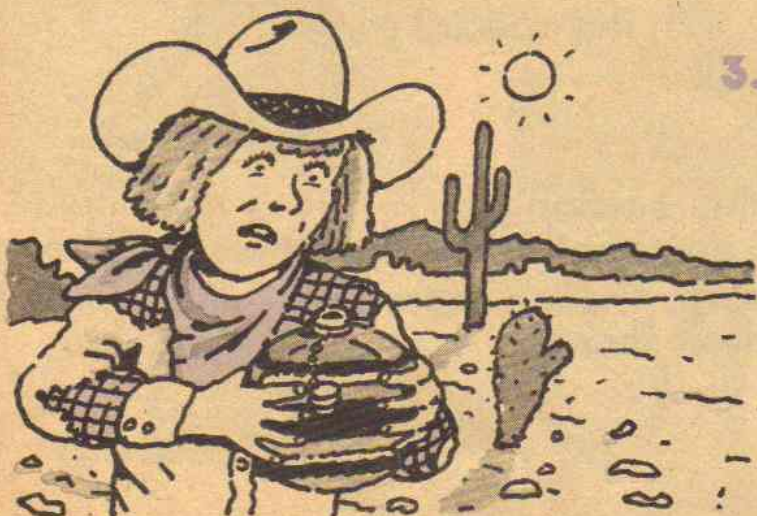
- (A) Take cover in a snow bank.
- (B) Jump up and down.
- (C) Roll in the snow.
- (D) Save your energy and wait for the forest ranger.



3. In the desert

You're collecting Indian pottery in the desert on a hot day. Reaching for your canteen, you find—gulp!—it's empty. You expected that water to last until you got back to the trading post several miles away. What should you do?

- (A) Rest on a windy hilltop.
- (B) Head for the trading post right away.
- (C) Eat your last baloney sandwich for energy.
- (D) Relax in the shade and wait for sunset to start hiking.





4. Heat exhaustion

You've been tossing a frisbee all afternoon with your cousin. Suddenly you feel strange and weak. Your cousin says you look pale and sweaty. Your breathing sounds funny. What should your cousin do?

- (A) Give you cold soda to drink.
- (B) Call a doctor.
- (C) Help you lie down with your head lower than your feet.
- (D) Tell you that overheating isn't possible because the sun wasn't shining.

5. Fall through the ice

Ice skating on the frozen pond is terrific. But as you glide along, *crack*—the ice breaks under your weight. You plunge into cold water up to your waist. What's your next step?

- (A) Take off your pants and skates so their weight won't pull you in deeper.
- (B) Hang onto the ice and wait for rescue.
- (C) Splash around to keep warm.
- (D) Try to climb out and roll along the ice.



6. No heat and hot water

The basement boiler broke and now—*brrr*—your home has no heat or hot water. Every room is cold at bedtime. Your family needs a safe way to keep warm at night.

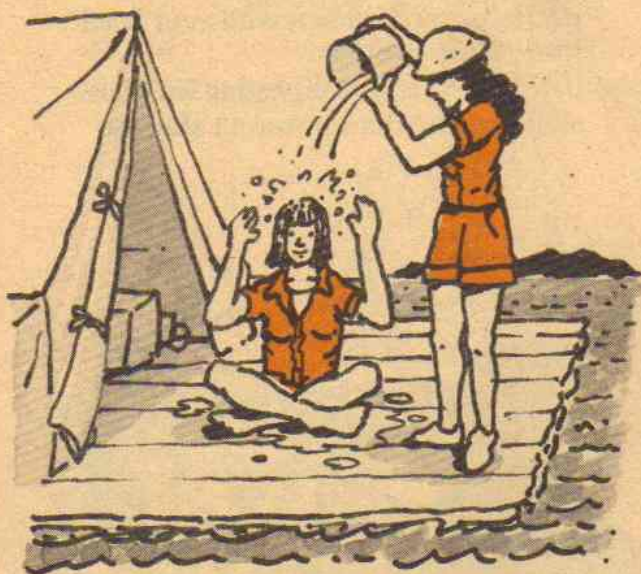
You could:

- (A) Plug in a small electric heater.
- (B) Sleep huddled together under several layers of covers.
- (C) Use the fireplace.
- (D) Turn on the gas oven and sleep in the kitchen.

(Answers on Next Page.)

Can You Beat the Heat?

ANSWERS



1. At sea without fresh water

(D) Wet your clothes with seawater. Let the ocean water cool your skin. If you keep your clothes wet, you'll sweat 74% less. Moving the sail for shade is also good, but it may make your raft go in the wrong direction. Keep your clothes on for protection from the sun. Get comfortable by loosening your shirt collar, sleeves and belt. And don't drink salty seawater! It will just make you thirstier.



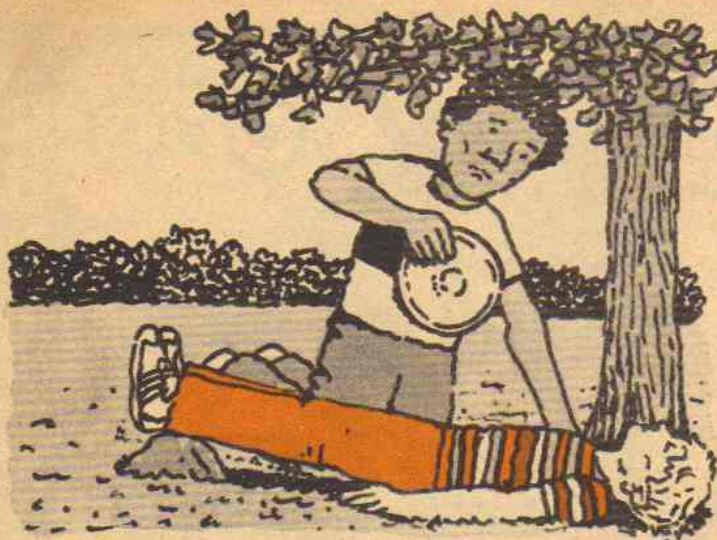
2. Lost in the winter woods

(B) Jump up and down. You must exercise right now to keep from freezing. Walk, shout and jump around to get your body warmed up. A snow bank can provide shelter, but exercise is more important when you're shivering a lot. Rolling in the snow will only make you colder.



3. In the desert

(D) Relax in the shade and wait for sunset to start hiking. You'll stay pretty cool near a shady cliff or even a big bush. Wait for sunset and you'll be able to walk three times as far. If you set off in the hot sun, you'd sweat a cup and a half of water every hour. Getting all dried out and overheated could make you faint. In the desert, things are tricky. Avoid that hilltop wind. It may make you feel warmer. And skip the baloney sandwich or any other salty foods. They will make you even thirstier.



4. Heat exhaustion

(C) Help you lie down with your head **lower than your feet**. Lying down is the best way to cool off quickly. You should rest and drink small sips of salted water. Soda, though, won't help. Heat exhaustion can happen even when the sun isn't shining. You're in something of a state of shock from getting too hot. If you feel better soon, you may not need a doctor at all.



5. Fall through the ice

(D) Try to climb out and roll along the ice. Even polar bears climb out of ice holes, so you can, too. Get flat in the water and put your leg over the ice's edge. Then roll to safety. Wait for rescue only if people saw you fall in. Hang on and support yourself with your hands flat on the ice. Then rescuers can slide you a light ladder or rope. They could even lie flat on the ice, forming a human chain to reach you. It's impossible to keep warm in cold water, so splashing around won't help. Your clothes won't pull you under if you hang onto the ice. Taking them off would leave you even colder. And next time, try not to skate on thin ice!



6. No heat and hot water

(B) Sleep huddled together under **several layers of covers**. It's always safe and cozy to sleep under lots of blankets. If it's very cold, share body warmth with your family. Even the dog might join you—but outside the covers! The fireplace and the electric heater are okay, but be careful. Some fireplaces smoke; make sure yours was checked for that. Small heaters can be tricky, too. Be especially careful not to touch them or drop things on them that might catch fire. A gas oven should never be used for home heating. Dangerous fumes may build up if the ventilation isn't good.

ROUTES

A GAME TO GET YOU GOING

Written by Phyllis Keaton

When you gotta go, you gotta go. But how are you gonna get there? The answer depends on a lot of things. How far are you going? How fast must you get there? How much can you spend? How does your ride affect the environment?

Every kind of transportation has its good and bad points. That's what this game is all about. Remember, the fastest way isn't always the best.

What You Need

Dice (one for each player) and coins or buttons for markers.

How to Play

1. Roll the dice to see who goes first, second and third.
2. Put your marker on the boat you want to start with. You will travel on this boat's path on the board.
3. Use dice to move around the board. When you land on a space, do what it says.
4. When you reach LAND, stop and choose your land transportation. You may pick any one you want. Then you will continue on your next turn. You will change again at AIR.
5. The first player to reach finish is the winner.

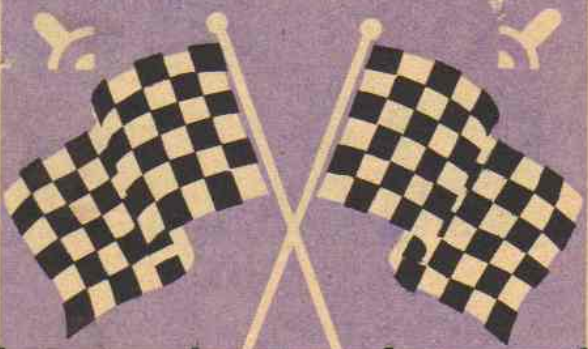


CHEAP
RIDE
AHEAD
2

YOU
CAR
POOL
GO
AGAIN

Daniel Plavin


FINISH




NO PARKING PROBLEM AHEAD 1		BUS CUTS YOU OFF LOSE A TURN
TRAFFIC JAM BACK 2	POLLUTION-FREE AHEAD 2	PEOPLE-POWERED GO AGAIN
AIR POLLUTER LOSE A TURN	STOP TO RECHARGE LOSE A TURN	
GET A TICKET LOSE A TURN		BIG HILL BACK 3
NOWHERE TO PARK BACK 3		YOU CAR POOL GO AGAIN
FAST CAR GO AGAIN	SMALL AND EASY TO PARK GO AGAIN	
STUCK ON GAS LINE LOSE A TURN	ELECTRIC POWER PLANTS POLLUTE BACK 2	FIX YOUR OWN FLAT AHEAD 1

DID YOU SAY NOISE POLLUTION? BACK 4	STOP TO REFUEL LOSE A TURN	WIND AGAINST YOU BACK 1
NON-STOP FLIGHT AHEAD 2	AIR TRAFFIC JAM BACK 2	
AIR POLLUTION LOSE A TURN	AIRSICK BACK 1	YOU CAN LAND ANYWHERE GO AGAIN
FASTEST FLYER GO AGAIN		HARD TO HANDLE BACK 2
YOU CAN'T AFFORD TICKET BACK 1	SMOOTH RIDE AHEAD 1	WIND PICKS UP AHEAD 3
GOES FAST AHEAD 3	NO SEATS LEFT BACK 2	
LITTLE POLLUTION GO AGAIN	SLOW GOING LOSE A TURN	


AIR



JET



SMALL PLANE



BALLOON

PLANE AND SIMPLE

by Jearl Walker

How to Get Your Paper Plane Off the Ground

Can you fly like a paper plane? If you try and take off over your bed, you'll crash land on earth with a big FLOP. So how come paper planes can fly when you can't?

"I weigh more," you say. That's true. But a jet plane weighs more than you do, and it flies. So there's more to flying than how much you weigh.

What flying is all about is forces. A force is something that pushes, pulls or in any way affects how things move. Gravity is a force. So is the wind. All planes—from paper ones to jumbo jets—are specially made to use forces to stay in the air.

When you toss a plane in the air, there are several forces working on it. Gravity pulls the plane down to earth. But the power in your arm is pushing it ahead. This push is called thrust.

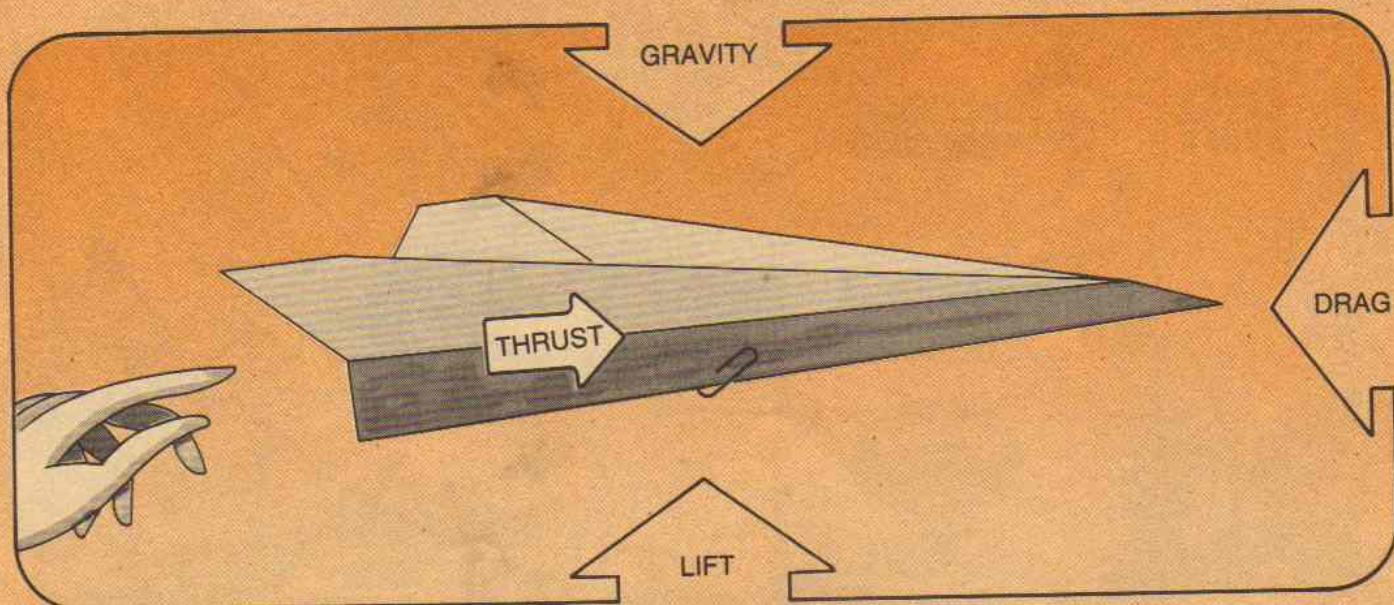
There is another force that slows the plane's fall and makes it fly longer. You have felt something

like this other force when you run very fast. The air whooshes against you, pushing you back and slowing you down. That force is called drag.

When a paper plane is flying, the air pushes against it with drag, too. But it doesn't just slow it down. Because a good paper plane has its nose tilted up a little bit as it flies, part of the air's push is up. You can see this in the picture below. It is this upward push, called lift, that slows the plane's fall and helps keep it flying.

You have to make your plane carefully if you want to use forces to keep it flying. If the wings are too small, for example, there would not be enough space for the air to push against.

On page 26 you will find flying tips. To see how they work, you must first build a plane. You can make a plane like the one on the next page. Or design a plane of your own. Our tips will make any paper plane fly better.

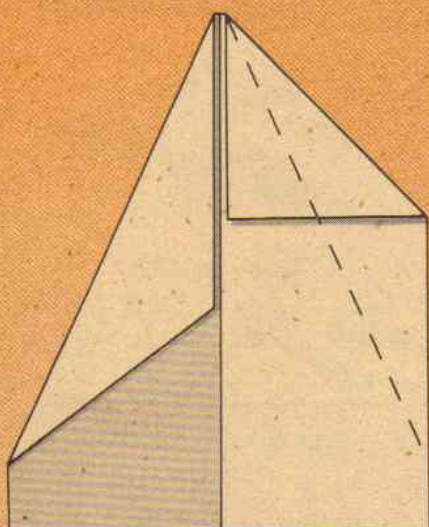
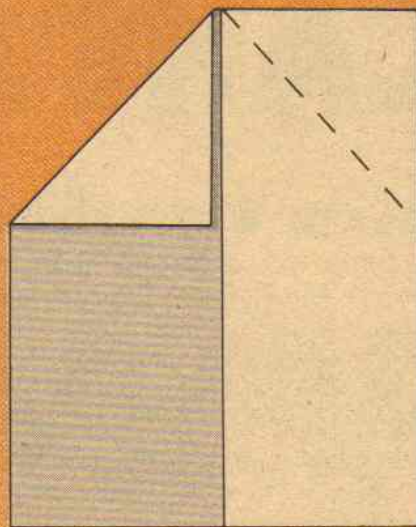


You Can Make a Paper Airplane in Seven Easy Steps

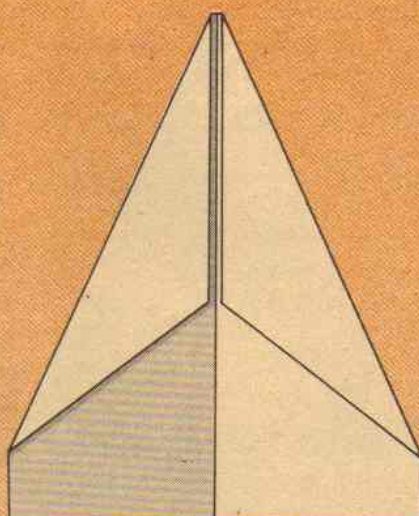
- 1** Take a piece of paper about the size of this page. Fold it in half the long way. Always make your folds nice and firm.



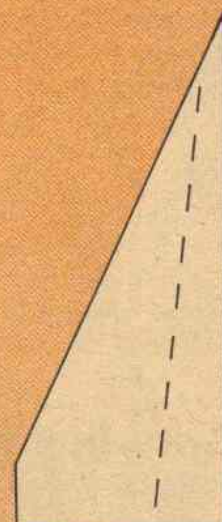
- 2** Unfold the paper. Now fold the two corners to make the nose of the plane. Make all folds along the dotted lines.



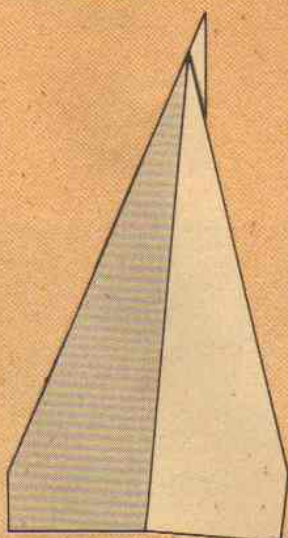
- 3** Fold both corners again towards the center.



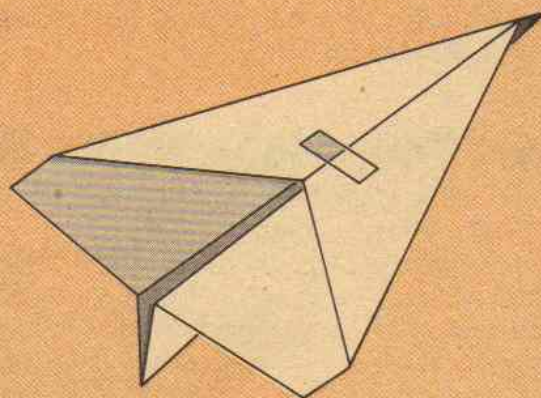
- 4** Your plane should look like this.



- 5** Fold the two halves of your plane together. The dotted line shows where you will make your next fold.



- 6** Fold one wing down to make the plane's body. Turn the plane over and fold the other wing down the same way.



- 7** To keep the wings together, put a small piece of tape across the top. Now turn the page and start flying!

PLANE AND FANCY

1. How to Win a Flying Contest

Moose, the 200-pound paper plane champ, can throw his plane harder than you. But you can still make your plane fly farther.

Put a paper clip onto the body of your plane, somewhere near the middle. This will make your plane a little heavier and raise its nose a tiny bit. Now your plane will catch more of the air's lift and stay up longer. You must experiment to find the perfect place for the clip. You might even try using more than one. But be careful! Too much weight up front will send your plane into a nose dive; too much in the back will make it go straight up.

2. Take a Turn for the Better

You're stuck inside on a rainy day. There's not much room and you want to keep your plane going. Why not send it down the hall and, with a quick turn, into the kitchen? It's easy, if you add flaps.

Make two cuts on the back edge of each wing (see picture). This gives you two wing flaps.

To turn right, fold the left wing flap down. Now fold the right wing flap up. During the flight, the air will now push the right wing down and the left wing up. Your plane will glide to the right. If it doesn't work, try folding your flaps a little less.

To make your plane glide to the left, fold the two flaps in the opposite directions. Simple!

3. Throwing Your Plane for a Loop

You're in a tiny room with a high ceiling. A straight-ahead plane will crash into the wall. How about flying it high and making a flip-flop? You can do it with those same two flaps.

Fold both flaps so that they are pointing up. The back of the plane will now go down, while the front shoots straight up. The plane will try and straighten out as it turns over, and you'll end up with a nifty loop in mid-air.

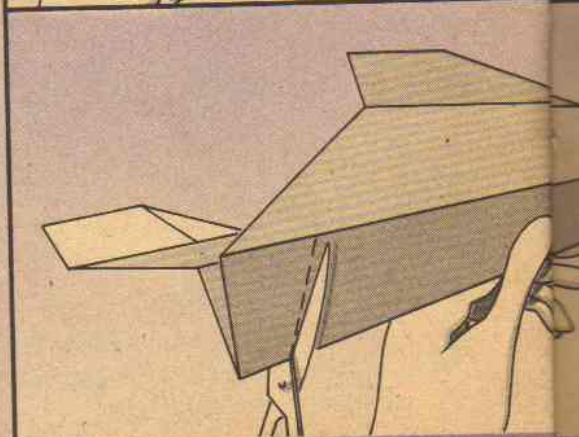
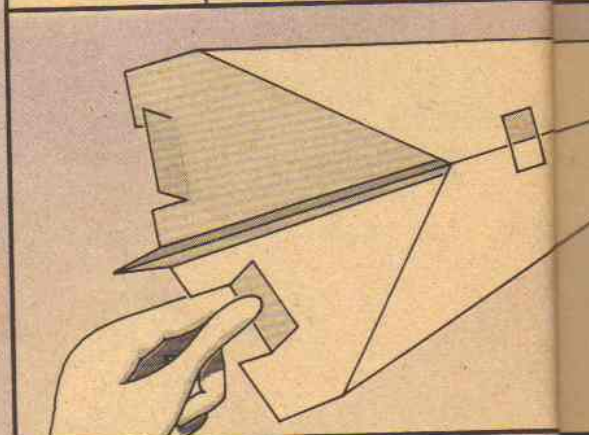
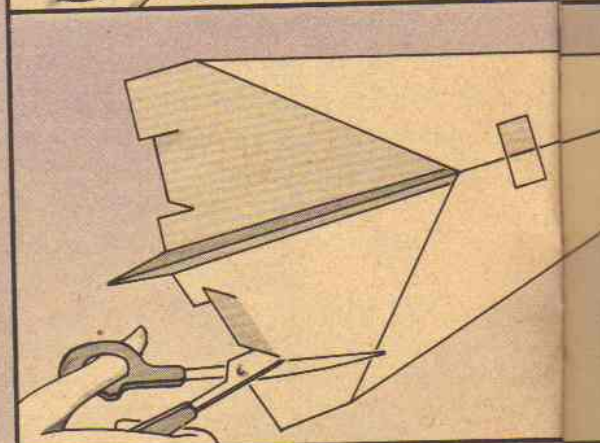
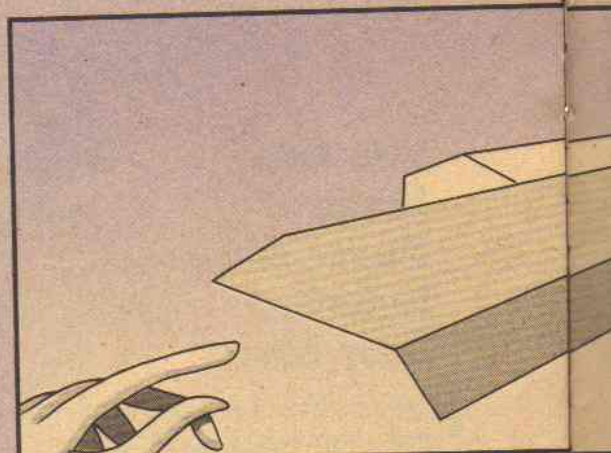
If this doesn't work, try putting a paper clip towards the back. This will push the nose up even quicker.

4. Cast Your Plane to the Wind

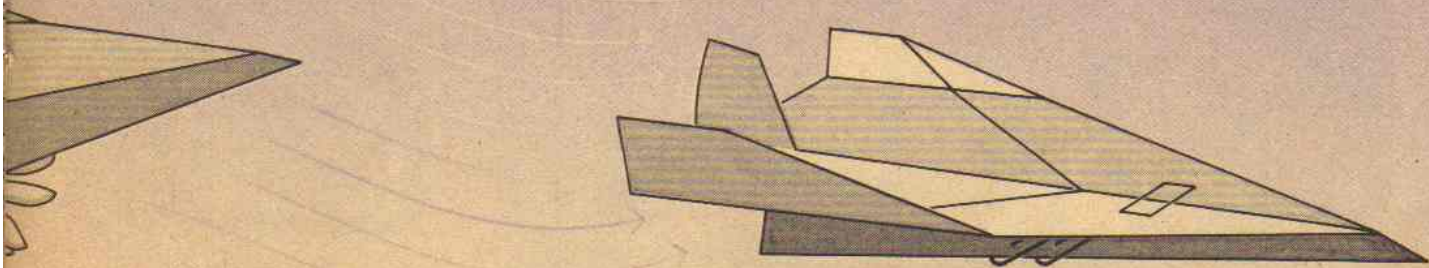
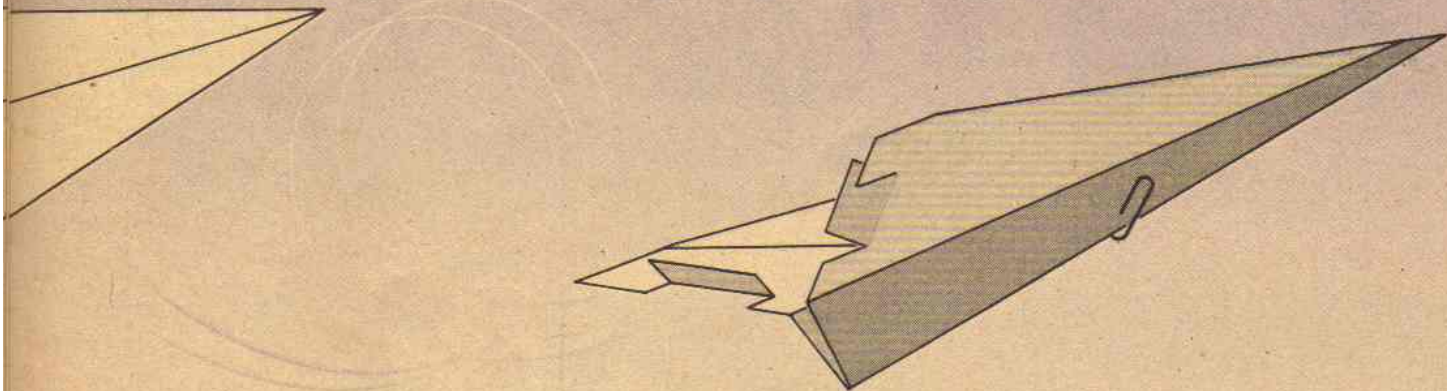
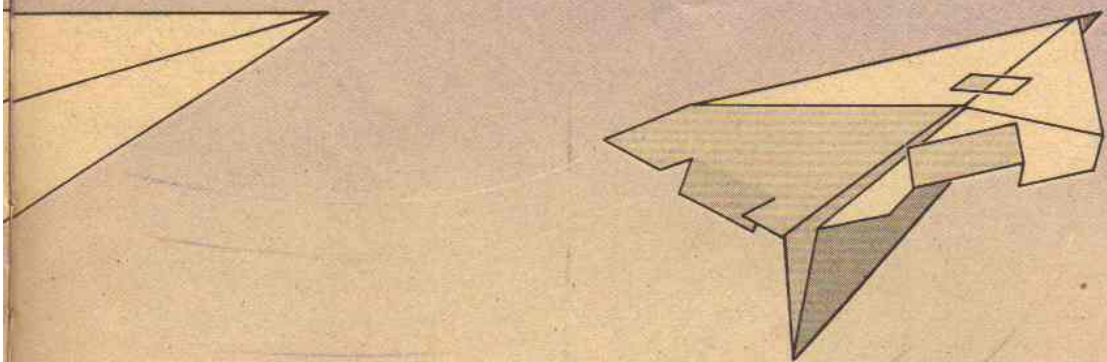
A windy day can be as great for paper planes as it is for kites—if you know how to use the wind.

First make some new flaps, like the ones in this picture. Fold the edges of both wings up about one inch from the end. Now make a cut near the back of the plane. Push this piece up to make a tail. These changes will keep your plane from shaking back and forth in the wind. To make it even less wobbly, add a couple of paper clips to the center of the body.

Finally, throw your plane with the wind at your back. Against the wind, there's too much drag. But if you take advantage of the wind's force, your plane will really take off!



Ways to Make Your Plane Do What You Want It to Do



Each week on television, 3-2-1 CONTACT will look at a different science theme. After you watch the show, use *Reviews and Previews* to find out even more about these themes.

Reviews & Previews

Forces: Do you want to learn how to make a paper plane that looks like a flying saucer? You can, in *The Paper Airplane Book*. It's written by Seymour Simon and published by Puffin Books. It is filled with diagrams and drawings that show how to make all kinds of airplanes. Look for it in your library or bookstore.



Book

Hot / Cold: What's a shooting star? Why does a dentist's drill hurt so much? The answers to both questions have something to do with heat. *Heat and Fire*, by John M. Scott, talks about just that—heat and fire. The book is published by Parents' Magazine Press. Look for it in your library or bookstore.



Book

Growth / Decay:

When these eggs hatch, the babies make their own parachutes. Then the wind carries them away to new homes. What are they? Spiders' eggs!

What's *Hatching Out of That Egg?* is a guessing game in book form. It's written by Patricia Lauber and published by Crown. You can find it in your bookstore or library.



Book

Hot / Cold: It's so cold in the Antarctic that you could keep your snowballs there all year round and they would never melt. In *The Arctic and The Antarctic*, you can find out more about the North and South Poles. It's written by Lee Pennock Huntington and published by Coward, McCann & Geoghegan. Look for it in your library or bookstore.



Book

Growth / Decay:

What do syrup, crayons and chewing gum have in common? They all come from trees! To find out more, send for a tremendous poster called: "What We Get From Trees." Write to:

Office of Distribution
Forest Service
U.S.D.A.
P.O.B. 2417
Washington, D.C. 20013



Light / Dark: Most museums aren't in people's houses. But inventor Thomas Edison's winter home has been turned into a museum.

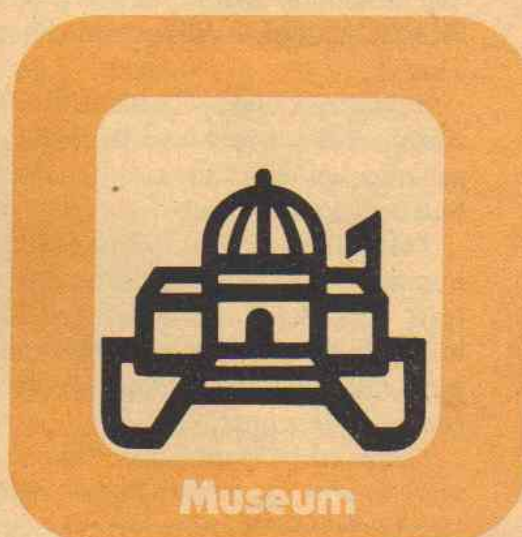
You can peek into Edison's living room and see light bulbs he made 75 years ago—still burning! You can look in on his crowded, dusty laboratory. In the exhibit hall, you'll see dozens of old

continued below



Food / Fuel: In a story called "The Best Present of All" you will read about how we can make electricity without creating pollution. You'll also find out what problems the energy we use now, like coal and oil, can cause. Write to:

National Wildlife
Federation
1412 Sixteenth St., N.W.
Washington, D.C. 20036



Hot / Cold: You can lasso an ice cube. All you need is an ice cube floating in water, a string with a small loop, and salt.

Lower the loop onto the ice cube, making sure it lies flat on the ice. Sprinkle a pinch of salt on the loop and the ice. Wait about 10 seconds. Now "lasso" the ice out of the water!



record players and hear one of the first recordings ever made.

The Thomas Edison Winter Home Museum is in Fort Meyers, Florida. If you can't get there, why not visit a museum closer to home? After you do, write to us about it. Send your 100-word story to:

Reviews and Previews
3-2-1 CONTACT
P.O. Box 2935
Boulder, CO 80322

THE BLOODHOUND GANG

The Case Of The Cheatskate

by Ellen Weiss

Vikki, Ricardo and Zack, otherwise known as the Bloodhound Gang, sat in the back of the bus, bumping their way to the Winter Olympics tryouts. Vikki and Zack were huddled over the sports page of the newspaper.

"Hey, look at this," said Vikki, frowning. She pointed to a headline: "WINTER OLYMPICS SCANDAL—Wilkes Falls For a Second Time."

"Boy," said Vikki. "That's really a bummer. Alison Wilkes is my favorite skater. And wait, get a load of this," she continued excitedly. She read to Zack from the story:

"After the accident, Sonia Peterson, the number two contender for the spot on the team, was seen laughing with a friend. When asked about her chances to make the Olympics, Peterson said, 'I'm out to win, and I don't care who gets hurt.'"

"That creep," said Vikki. "She doesn't deserve to win. Everybody knows Alison is a better skater. I don't know how she could have fallen twice in one week. It's just weird!"

"Huh?" inquired Ricardo brightly.

Vikki turned to him. "Oh, I forgot. You're not into figure skating, are you?"

"No, speed skating is much more exciting."

"Well, figure skating can be pretty exciting, too. For instance, I have a hunch that Alison Wilkes' falling is no accident. What do you think of that?"

"Maybe we'll find out if you're right," said Zack. "We're here."

Flash Makes A Pass

After they had found their seats, Vikki suddenly gave Zack a hard elbow in the ribs. "What luck!" she whispered. "Alison Wilkes,

in person, sitting right in front of us!"

"Big deal," muttered Ricardo.

"I'm going to get her autograph," said Vikki. "Save my seat, will you?"

But before Vikki could get to the small, dark-haired Wilkes, someone else had beaten her there: a large man in a green sweater. He grabbed the figure skater by the arm, and was speaking in a low and ugly tone of voice.

"Why won't you go out with me?" Vikki heard him say. "You think you're too good for me?"

Wilkes pulled her arm away. "Oh, flake off, Flash," she said. "You sure have a weird way of making friends!" He moved away, scowling.



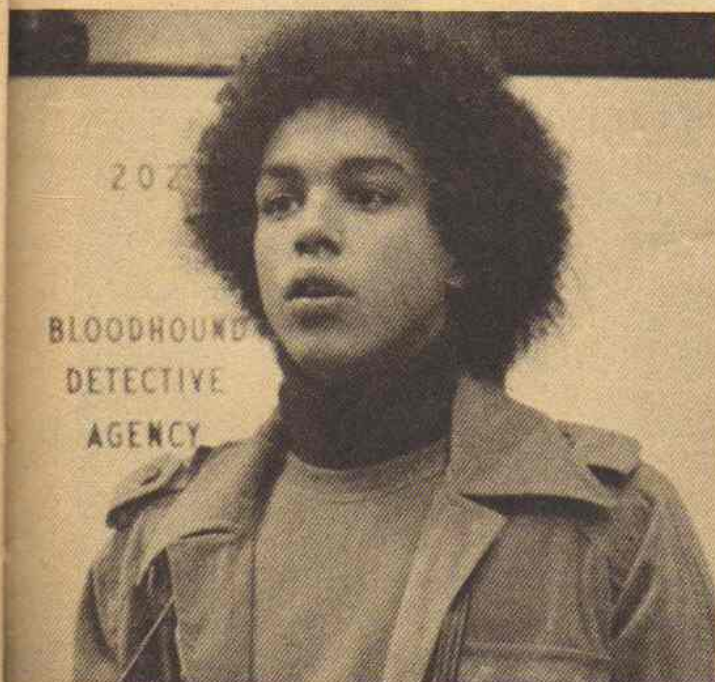
"I have a hunch that Alison Wilkes' falling is no accident," said Vikki.

Alison gave Vikki a smile. "Some guys . . . you know what I mean?"

"Sure," replied Vikki "—I think." Then she couldn't think of anything to say. "Miss Wilkes," she blurted, "I think you're the greatest. Could I have your autograph?"

"Sure. Got a piece of paper?"

Vikki searched wildly in her bag. All she could find was a business card that said "Bloodhound Detective Agency."



"I don't think Alison was the only person out there this morning. And I think I know who the other one was," said Ricardo.

"Well, well," said the skater. "A detective! Do you work with the famous Mr. Bloodhound?"

Vikki blushed. "Well, actually," she said, "I'm one of his top assistants."

Alison signed her name—"To Vikki the detective"—and Vikki hurried back to her seat.

She took a thoughtful bite of Zack's hot dog. "Seeing her in person, I just can't believe how tiny she is," she said. "She couldn't weigh more than a hundred pounds!"

"That other one, Sonia Peterson, is tiny also, isn't she?" asked Zack.

"Yes," agreed Vikki. "But, talking about size, that big guy really gave me the shivers. He really came on strong."

"That big guy' was Frank 'The Flash' Fried-

man," said Ricardo. "He's the fastest speed skater in the business. They say he can do the 500 meters in 35 seconds!"

"Well, he sure can't make time off the ice," said Vikki.

Footprints On The Ice

Next morning, the phone rang. "Good grief," thought Vikki, who was just opening up the office, "who'd be calling at eight o'clock on a Sunday morning?" She picked it up.

"Good morning, Bloodhound Detective Agency. Whenever there's trouble, we're there on the double. Mr. Bloodhound isn't here."

The voice at the other end was familiar.

"Hi, this is Alison Wilkes. I remembered your card from yesterday. I need help. Can you meet me at the lake right away?"

It wasn't more than an hour before Vikki had rounded up a sleepy Ricardo and Zack and arrived at the deserted-looking lake. Alison was waiting for them.

"I figured out what was wrong," she said hurriedly. "I've been set up! I took a close look at my skates this morning, and the blades are bent! Just a little, so you'd hardly even notice it—just enough to mess up my footing. I think somebody is doing it little by little."

Ricardo and Zack were already looking around the area, talking quietly. Meanwhile, Vikki questioned the skater.

"When are your skates out of your sight?"

"Never! I had them specially made, and they go wherever I go."

"Are you sure you never leave your skates alone?" Vikki asked.

"Well, there is something. I like to come out here early, when the ice is fresh, and practice at the far end of the lake. Sometimes I'll leave my skates while I go get a drink. But that's never more than a couple of minutes."

"That's a start," said Vikki. "Can you think of anybody who would do this?"

"I know Sonia wants to win really badly," said Alison, "but I can't imagine that she'd do this."

Vikki walked over to join her friends. They were both on their knees.

"What are you looking at, guys?" she asked.

"Footprints, sort of," answered Ricardo.

"You can't find footprints on the ice, dum-

my!" exclaimed Vikki.

"You'd be surprised," answered Ricardo. "Take a close look at these skate tracks.

I don't think Alison was the only person out here this morning. And I think I know who the other one was," said Ricardo.

He stood up and walked over to Alison. "Would you help us with an experiment?"

The Trap Is Set

The next morning dawned bitterly cold. In the half-light, Alison Wilkes walked slowly around to the far end of the lake, her skates hung around her neck. She placed them on a bench and left, walking toward the water fountain hidden among the trees. She didn't look back.

There was silence for a long moment. Then, from the distance, there was the hissing sound of skates on ice, moving fast—very fast.

Suddenly all the lights were on. Ricardo, Zack, and Vikki stepped out of the trees. They had caught their suspect red-handed.

"Gee, Flash," said Ricardo, "how could a great skater like you do a dumb, mean thing like this?"

"Like what?" said Friedman, looking dumb and mean.

"Oh, don't give us that act," said Zack. "Not with those pliers in your hand."

"Come on," said Vikki. "Let's go. You have a choice: you can come quietly and talk to the Olympic authorities, or you can give us a hard time and get arrested by the police. Which will it be, Flash?"

Flash went along quietly.

Over hot cocoa the next morning, Alison said, "Gosh, I'm sure glad I didn't go out with him! But how did you figure out he did it?"

"First," said Zack, "Vikki saw him threaten you. Then came our first clue, thanks to Ricardo. There were two sets of skate tracks on the fresh ice. One set had shallow grooves, made by a light skater. The other set was much deeper. They looked as though they were made by somebody a lot heavier than you. That ruled out Sonia Peterson.

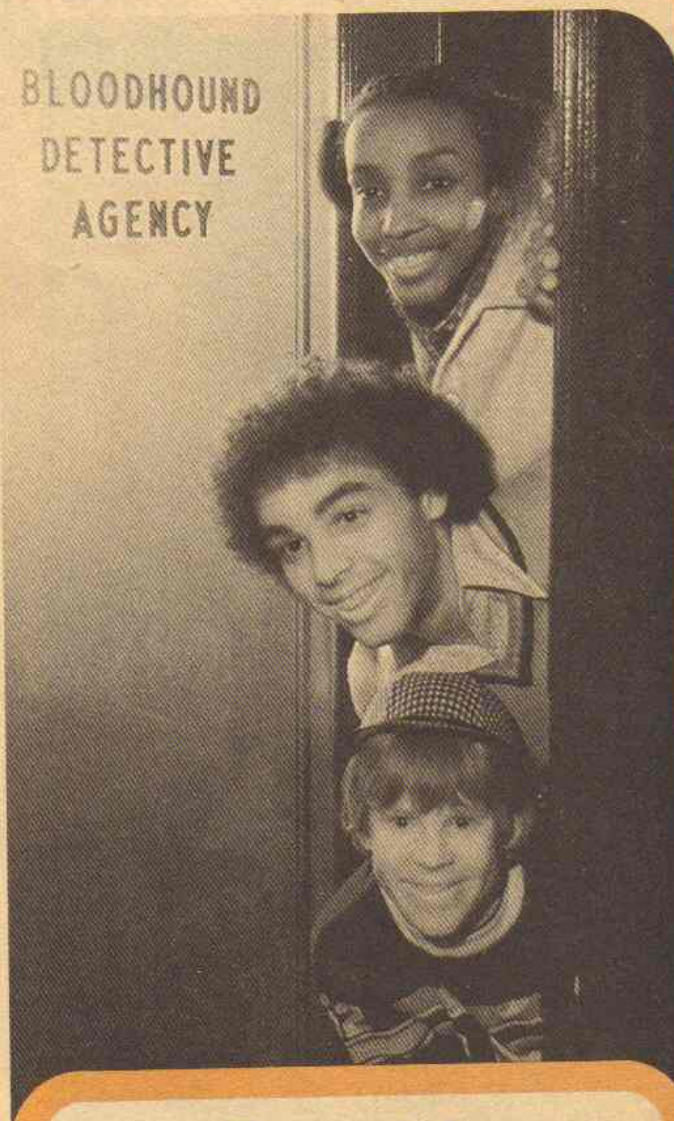
"Then," he continued, "I did a little figuring. The main gate is the only entrance onto the lake. That means someone had to skate across the lake, bend your skates, and skate

back to the gate in two minutes. The lake is about a quarter of mile long—400 meters or so. Friedman is the only guy around here that could do it easily: about half a minute each way, and over a full minute to work on your skates. Simplest thing in the world."

"You know, you're pretty terrific for a bunch of kids," said Alison. "How can I thank you?"

"How about getting us some tickets to see you skate," said Vikki. "—At the Olympics!"

BLOODHOUND
DETECTIVE
AGENCY



**Next month,
Vikki, Zack and Ricardo
investigate a very strange
kidnapping in "The Case of
the Purr Snatcher."**

DAY

THURSDAY

FRIDAY

SATURDAY

1



Yellowstone, the first national park, is established. (1872)

6

7

Alexander Graham Bell patents the telephone. (1876)



8

The first dog license is issued in New York City. (1894)



13

The planet Uranus is discovered by Sir William Herschel. (1781)



Happy Birthday
Albert Einstein
(1879)

$$\rightarrow E=MC^2$$

14

15

The first day of spring!

21



22

The washing machine is invented. (1797)

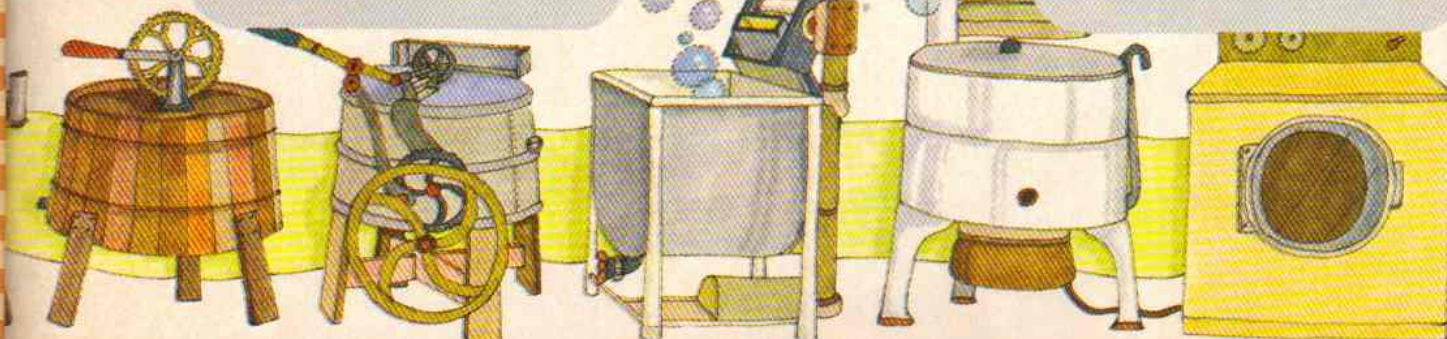
28

29

27

26

(1953)



Any Questions ?

How can you tell the North Pole from the South Pole?

There are a lot more differences than you might think. Pull out your trusty globe and take a look. On top is the Arctic Circle, with the North Pole smack in the middle. It's mainly water (well, really ice). At the other end of your globe, the Antarctic Circle is the opposite. It's all land. In fact, it's the fifth largest continent in the world.

You wouldn't exactly need your bathing suit at either place, but the Antarctic is a lot colder. Its summers are about 15°F cooler than those in the Arctic.

Now to get the people and animals straight. If you're thinking of penguins, you've got the South Pole. But if you want to see polar bears, head north. You won't find any people who are native to Antarctica. But several groups come from what land there is around the Arctic Circle. These include the Eskimos and the Lapps, who gave us (thanks, folks!) Santa Claus.

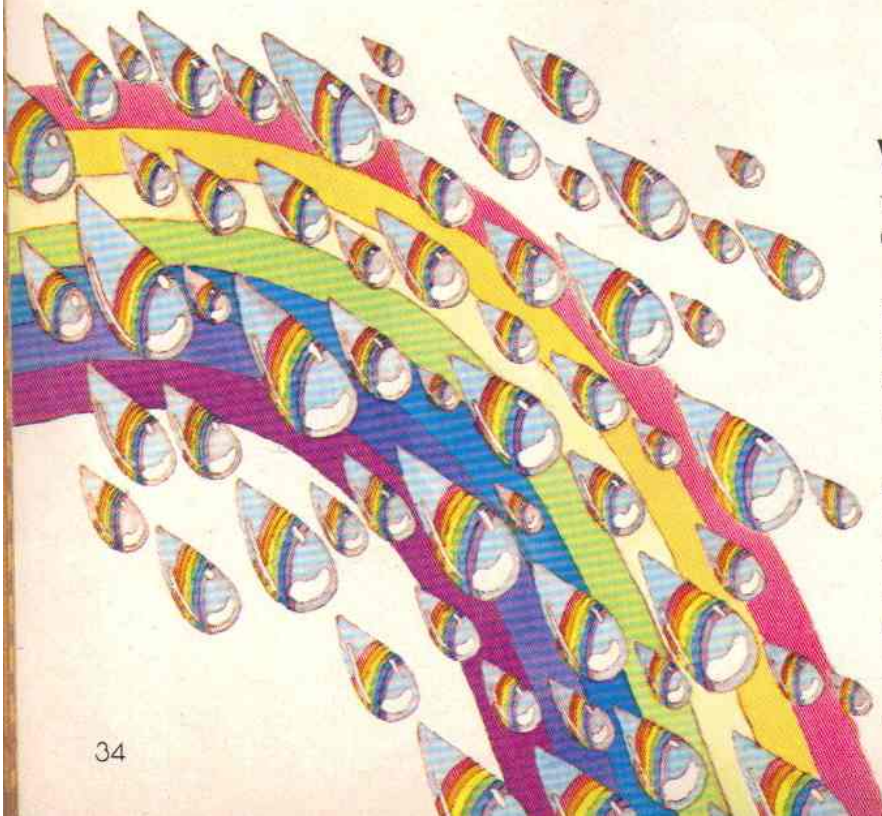


What's a rainbow? All sunlight is made up of the colors you see in a rainbow. But you can't see them unless there is moisture in the air.

When the air is wet, sunlight has a chance to show its true colors. As it shines through water droplets in the air, the light is broken into seven colors—red, orange, yellow, green, blue, purple and violet. These are the colors of the *spectrum*.

You usually see the colors of the spectrum on rainy days. But if you are lucky, there are other times you can catch them. If it rains at night and there is a bright moon, you might see a *moonbow*. In the morning, dew drops sometimes form a *dewbow*. And the moisture in fog can produce a *fogbow*.

Last but not least there is the *bow wow*. That's a dog, silly!



Is there something that you have been wondering about, for which you can't seem to find an answer? We just might be able to help. Send your question along with your name, age and address to:

Any Questions?
3-2-1 CONTACT
P.O. Box 2935
Boulder, Colorado 80322

What's the difference between a planet and a star?

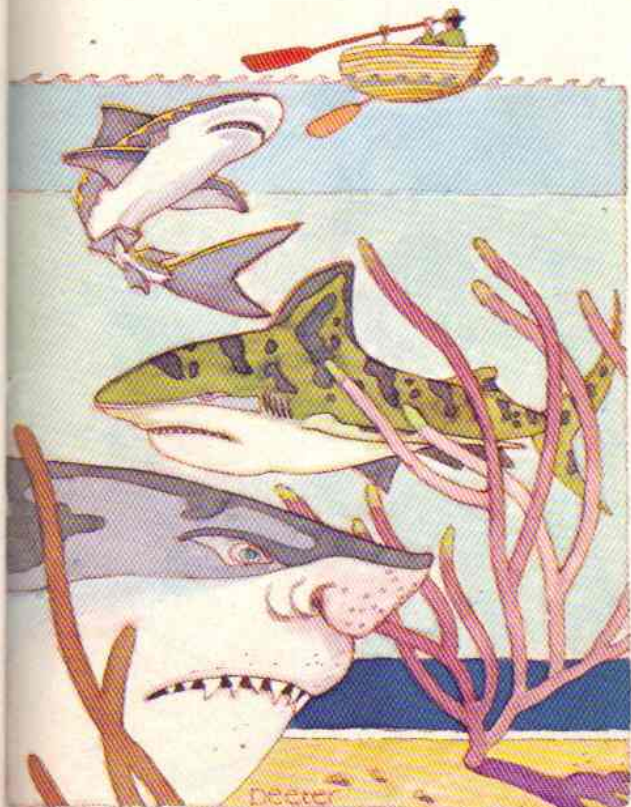
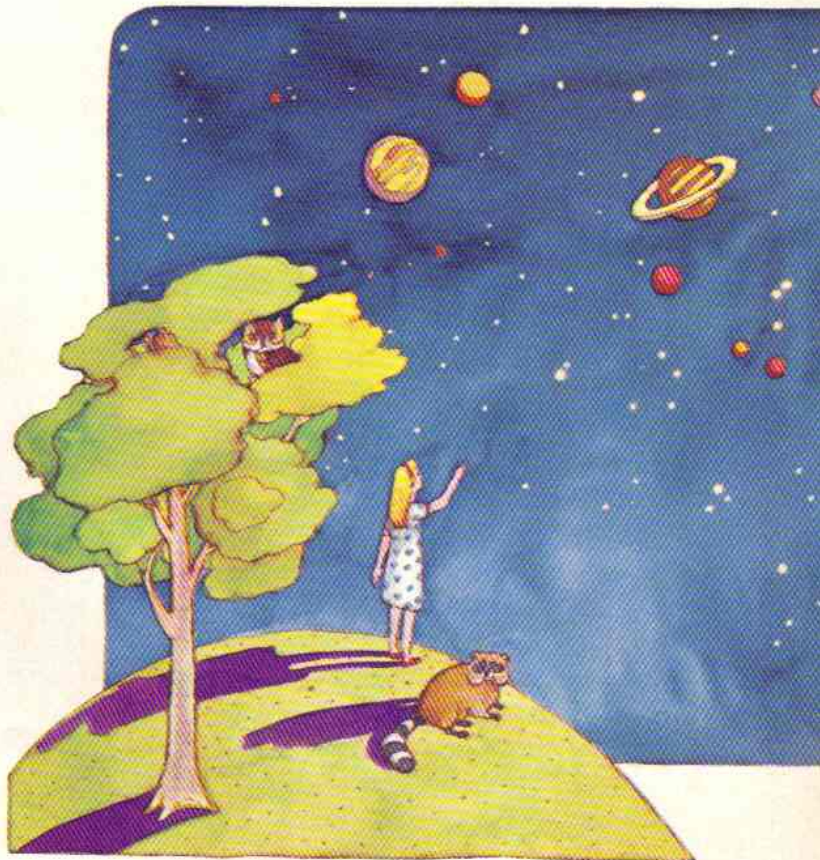
Planets live in outer space and stars live in Hollywood!

Actually, the difference is that planets, like Earth, give off no light of their own. Stars, like the sun, do. Simple.

Stars are very hot balls of gas. The biggest, the *red giants*, are much bigger than the sun. The smallest, the *white dwarfs*, are only about the size of Earth. The sun is your average, run-of-the-mill star.

While we know there are billions of stars, we have only found nine planets so far. Of the nine, some are *terrestrial* (made of dirt). These include Earth, Mercury, Venus, Mars and Pluto. The rest are sometimes called *Jovian planets*. They are larger and made up mostly of thick gas. These include Jupiter, Saturn, Uranus and Neptune.

All nine planets are part of our solar system. They orbit our sun. There are probably other planets orbiting other stars, but so far they have not been discovered.



Are all sharks dangerous?

Nope! There are 250 different kinds of sharks. Some are big enough to swallow you. Others are small enough to hold in your hand. Of all these, only 30 kinds are dangerous.

Believe it or not, the biggest shark is as harmless as a pussycat. The *whale shark* can grow up to 50 feet (15 meters) long. That's longer than a city bus! The good news is that a whale shark's teeth are very small. Because of this, the whale shark can only eat tiny sea animals and plants.

Of all the dangerous sharks, the *white shark*, which can grow up to 20 feet (6 meters), is the best known. This is the kind that you saw in the movie *Jaws*. Like most dangerous sharks, the white shark usually attacks because it is hungry.

In spite of what you think, shark attacks are rare. In fact, more people die each year from spider bites than from shark attacks. So *Jaws*, who are you kiddin' anyway?

Bones

How many bones are in your body? You don't know? Why, that's shocking! Without your bones keeping you in shape, you'd look like an overgrown jellyfish.

Let's go from head to toe and take a bone countdown:

head—8	shoulder—2
face—14	back—26
ears—6	ribs—24
neck—1	breastbone—1
collarbone—2	arms, hands and fingers—60
hips, legs, feet and toes—62	

That's 206 bones in all!

Meet Your Bones

You can't feel all your bones. Many are too small or hidden below layers of muscle. But here's a quick tour of some easy-to-find bones.

Run your hand from your knee to your ankle. That bone is called your tibia (TIB-ee-uh). Feel the inside of your ankle. The part that sticks out is the end of the tibia. Now feel the outside of your ankle. That's the end of another bone in your leg. This one is called the fibula (FIB-you-luh).

Now feel your elbow. Slide your hand down the inside of your arm. You just felt your ulna (ULL-nuh).

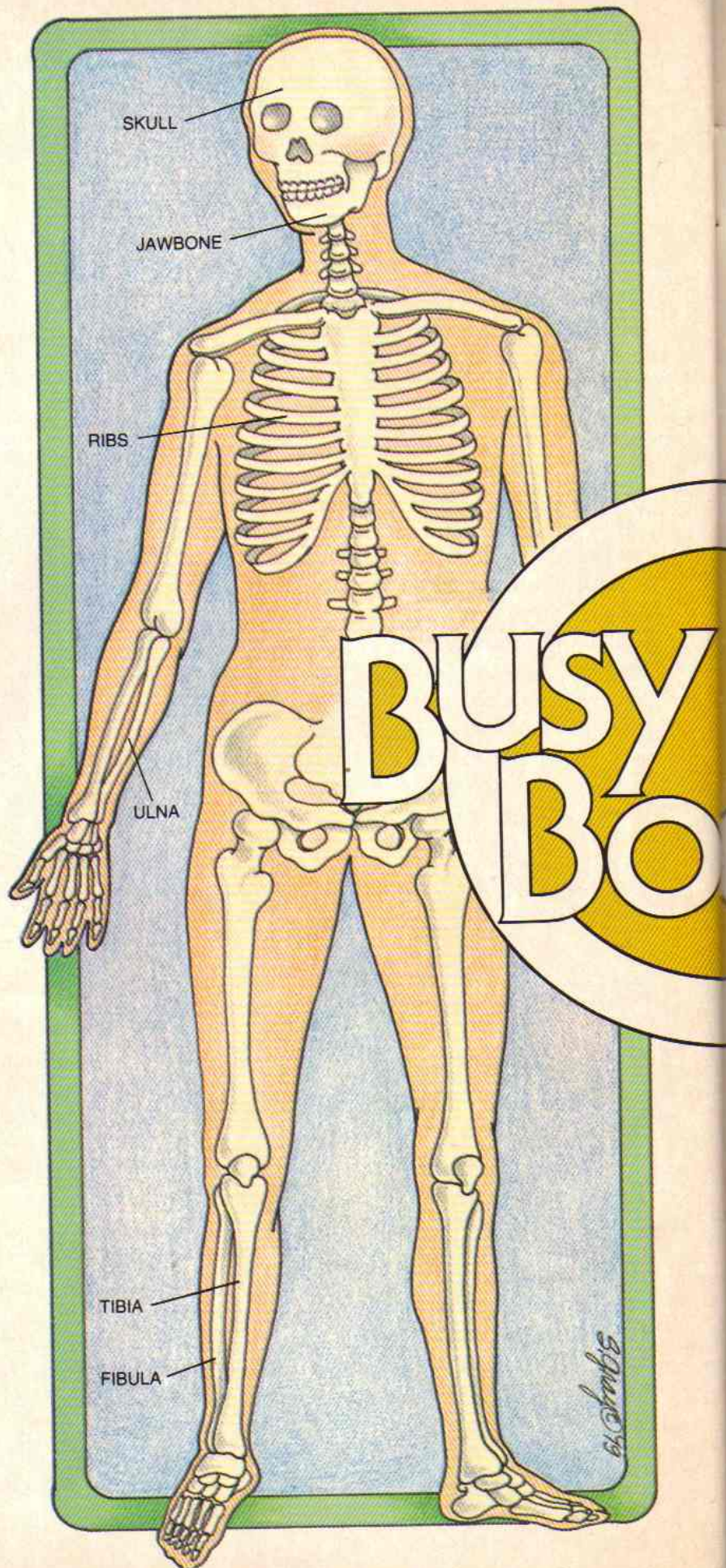
Now try a few on your own. Can you find your ribs and count them? How about your skull? Your jawbone?

Bone Jobs

Bones keep your body in shape. But they have other jobs, too. They protect organs inside you, like your heart and brain. Without this armor-like protection, you'd get hurt more often and more seriously.

Wait, there's more! Your body needs red and white blood cells. They are produced inside the soft center of your bones.

Bones even help you hear. No kidding! In each ear are three tiny bones. Suppose your dog is barking. When the sound reaches these bones, they vibrate. Nerves feel the vibration. They send your brain a message, and you hear "woof!"



Beware!

Recognize that flag? It's the skull and crossbones. Pirates flew these flags to let people know . . . well, that they were pirates. The crossbones, by the way, are leg bones, called femurs (FEE-mers). You can still see skulls and crossbones on jars and bottles. No, it doesn't mean there are pirates inside. But it does mean the jar holds something harmful. So, BEWARE!



Bones Are Alive! Eek!

All your bones are made of the same stuff. There are non-living materials. These are minerals like *calcium*, that make your bones hard.

Then there is living material. This is the cell tissue that makes your bone grow.

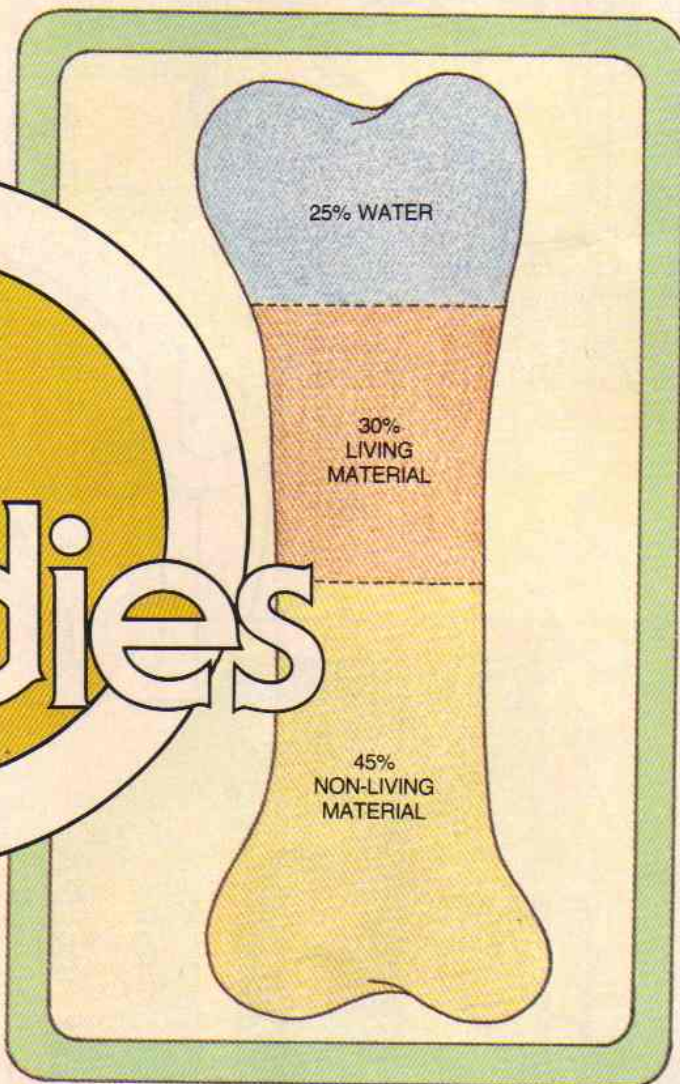
Finally, there is water in your bones, like there is in nearly all parts of your body.

The bone on the left shows what's inside a bone. There is one big difference. In real bones, all this stuff is mixed together.

Not only are your bones alive, they're growing all the time.

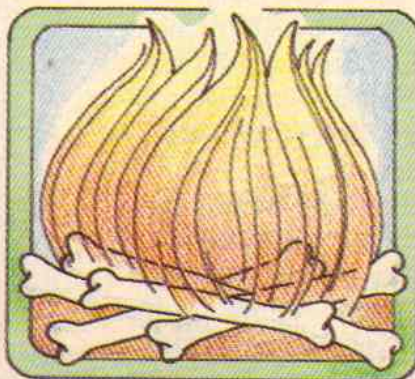
A baby has very soft bones made of *cartilage*. As the kid grows, his bones get bigger. The cartilage is replaced by harder, stronger bone. This harder bone is filled with calcium.

When this kid is about 20 years old, his bones will stop getting bigger. But inside the bones, there is still a lot of growing going on. Old bone cells dissolve. Their places are taken by new healthy bone cells. Because bones keep growing, your body is able to fix any that break. For more on that, see page 39.



Bone Fires

Hundreds of years ago, people used to make piles out of old bones and burn them. Why? To keep away the evil spirits, of course! These giant outdoor fires are still built. But instead of using bones, people use sticks. And now they're called bonfires instead of BONEfires. Honest!



Experiment #1: The Amazing Rubber Wishbone

Next time you have chicken for dinner, grab the wishbone. Wait, don't make a wish! Try this instead.

1. Clean off the wishbone. Put it in a jar. Pour in enough vinegar to cover the bone. Now close the jar.
2. Every couple of days, dump out the old vinegar and pour in new vinegar.
3. After a week or so, remove the wishbone and wash it off. Try and make a wish. The bone should bend like rubber. You can even tie it in a knot.

Why does this happen? We told you that it's the calcium in bones that makes them hard. The vinegar caused the calcium to dissolve. Once this mineral was gone, the bone turned rubbery.

Experiment #2: The Incredible Shrinking Kid

This sounds too easy to even try. But be careful! If not, you won't see the results you want.

1. Measure yourself very *carefully* when you get up in the morning. Then do the same thing at night.
2. Repeat this several days. Each time compare your height in the morning to your height in the evening.

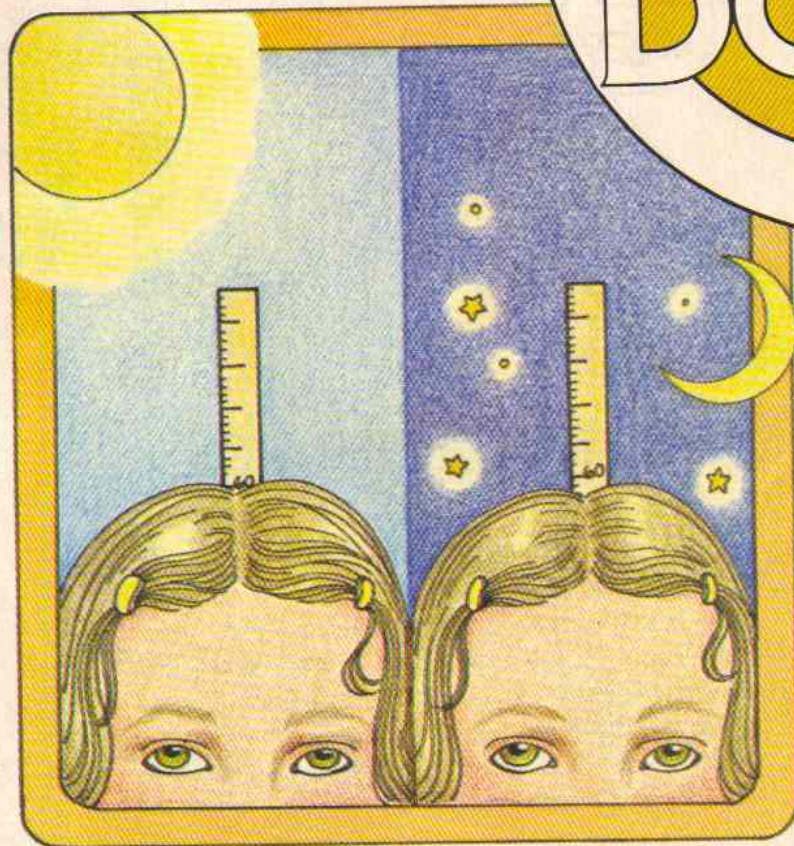
You should discover that you shrink during the day. The difference is almost too little to notice. But it is there.

What happens is that your backbone shrinks. Your backbone is made of many smaller bones called *vertebrae* (VERT-uh-bray). Between these bones are soft discs. These discs, filled with liquid, cushion your bones.

During a day of running around and jumping, some liquid is squeezed out of the discs. The bones get pushed closer together and you shrink. While resting at night, the liquid returns and you go back to your "normal" size.



BUSY BO

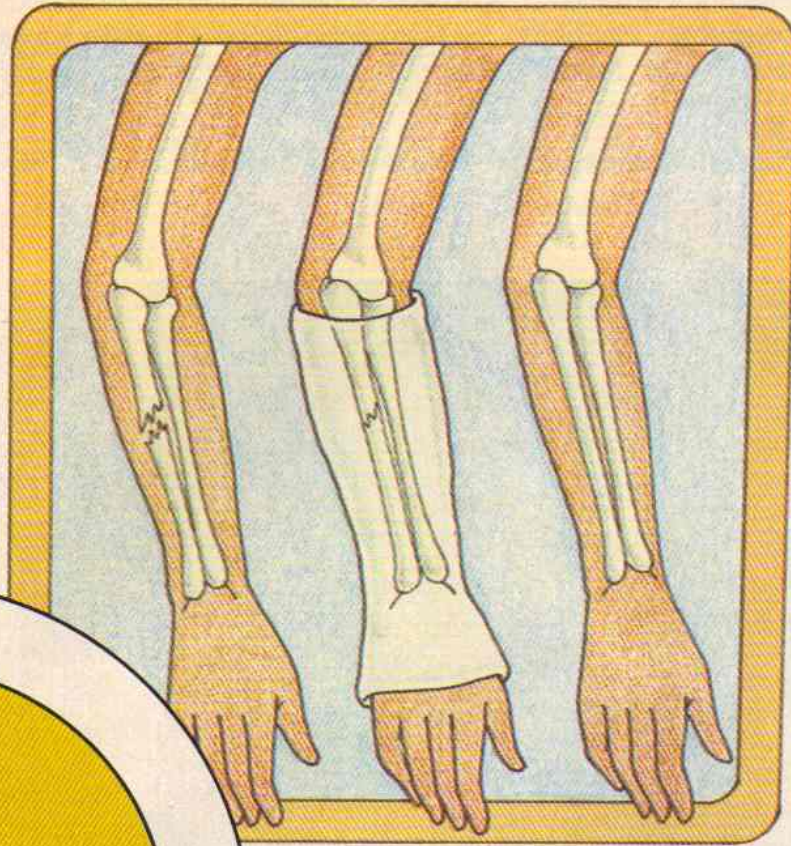


Those Are the Breaks!

Your bones are pretty strong. But when they hit something even stronger, they break. Lucky for you, an amazing healing process takes place.

Let's say you busted your arm playing football. First your broken bone is put together by the doctor. New bone cells start growing out on both sides of the break. When they meet, they weave together, like a web. Your bone has now been glued back together. After a few more weeks of growing bone cells, your arm is repaired. You're ready to get back out and catch a few touchdown passes.

The worse the break, the longer it takes to heal. Usually, big bones, like the ones in your leg, take a lot longer than small bones, like the ones in your fingers.



Casts of Thousands

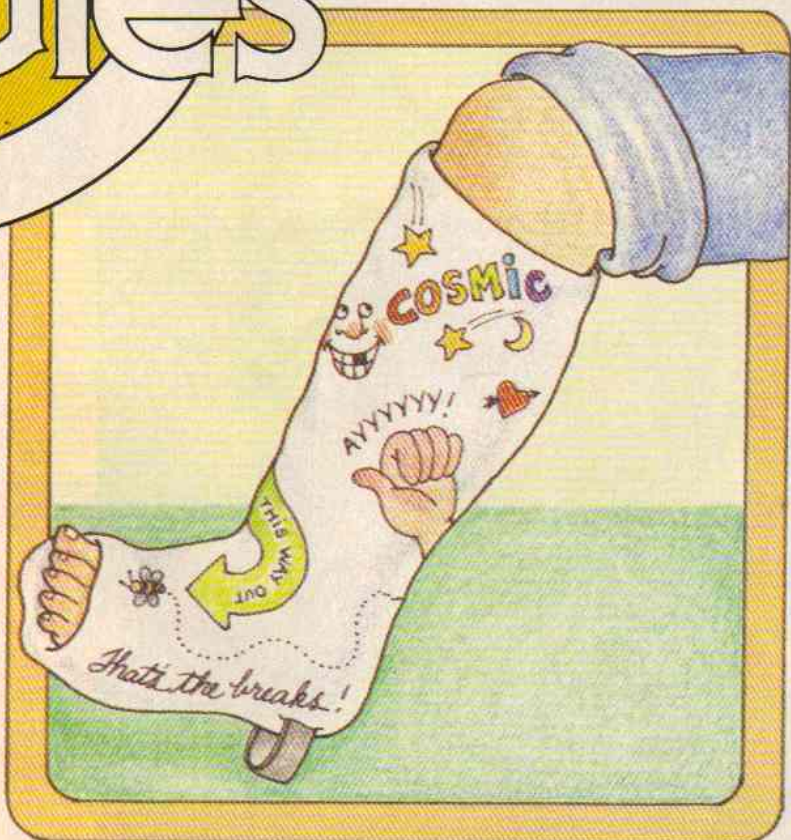
Of course you've seen people hobbling around with heavy white bandages on their arms and legs. Unless you go to school with a bunch of mummies, you've been seeing people with broken bones.

As soon as possible, a doctor will put a broken bone in a cast. This is the only way to be sure it heals right. Bones start healing almost as soon as they break.

The doctor wraps gauze and plaster around your arm. The plaster gets hard. Your cast is set. This keeps the broken bone from moving and gives it time to heal.

Once the bone has had time to heal, an electric saw is used to cut off the cast. Yikes! Fortunately, this special saw cuts through the cast, but doesn't even scratch your skin. Whew!

—written by Rae Paige



dies

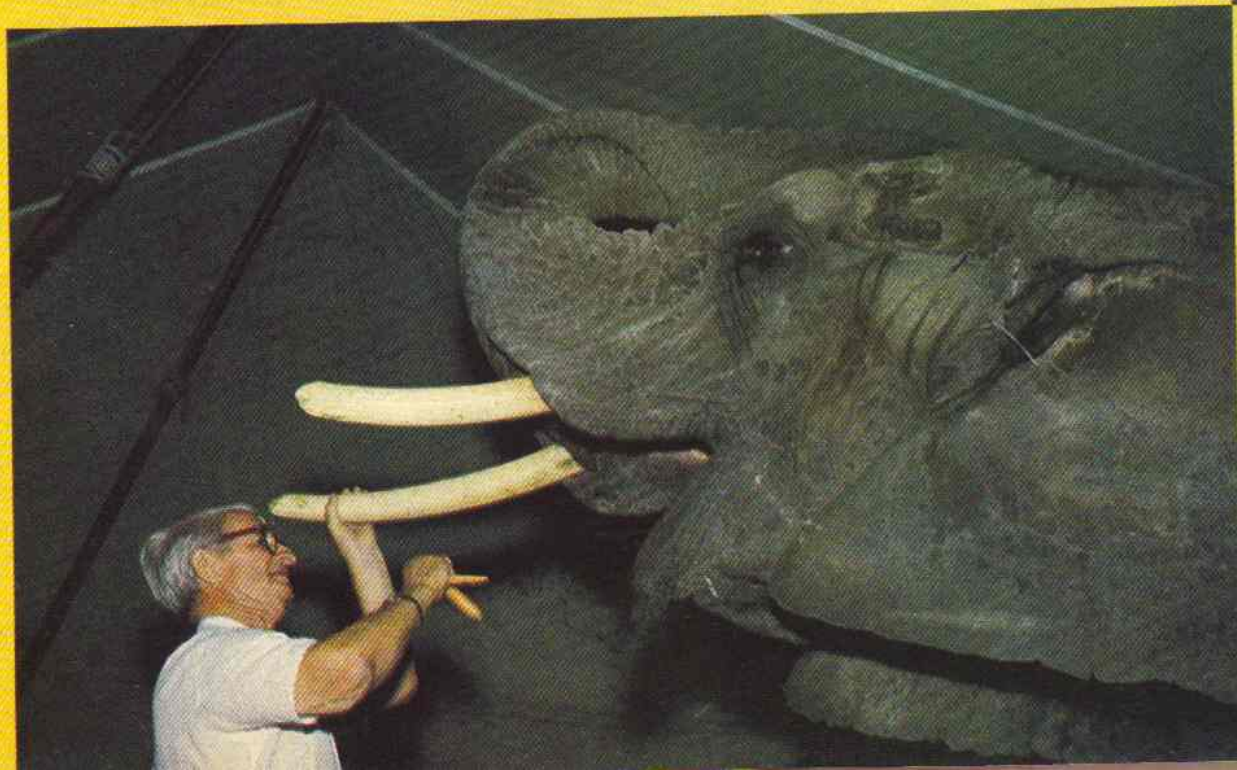
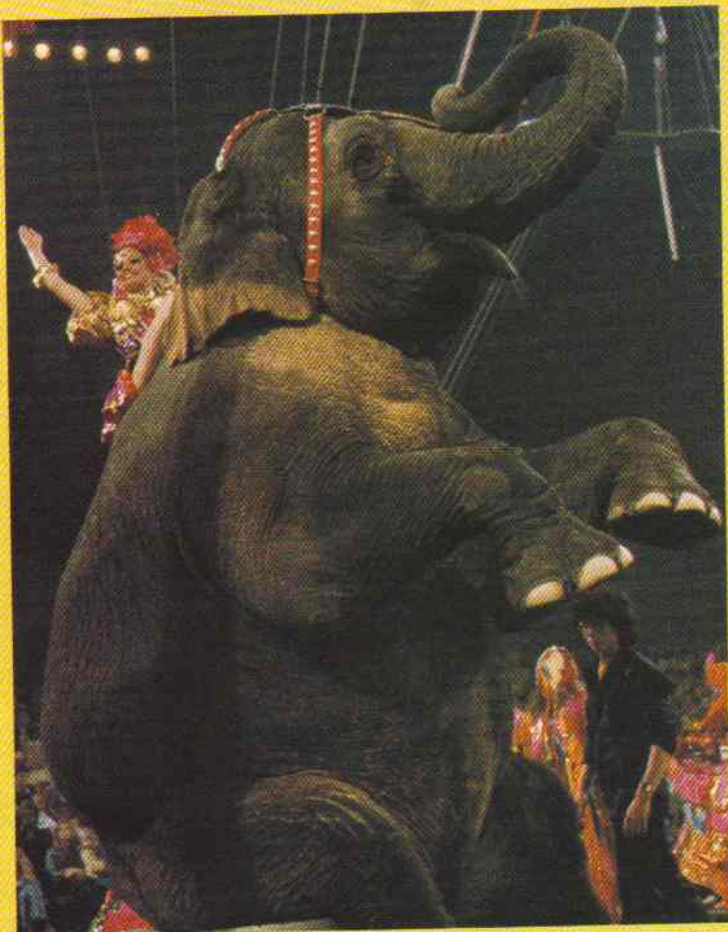
THE GREATST

THE LIFE OF A CIRCUS VET

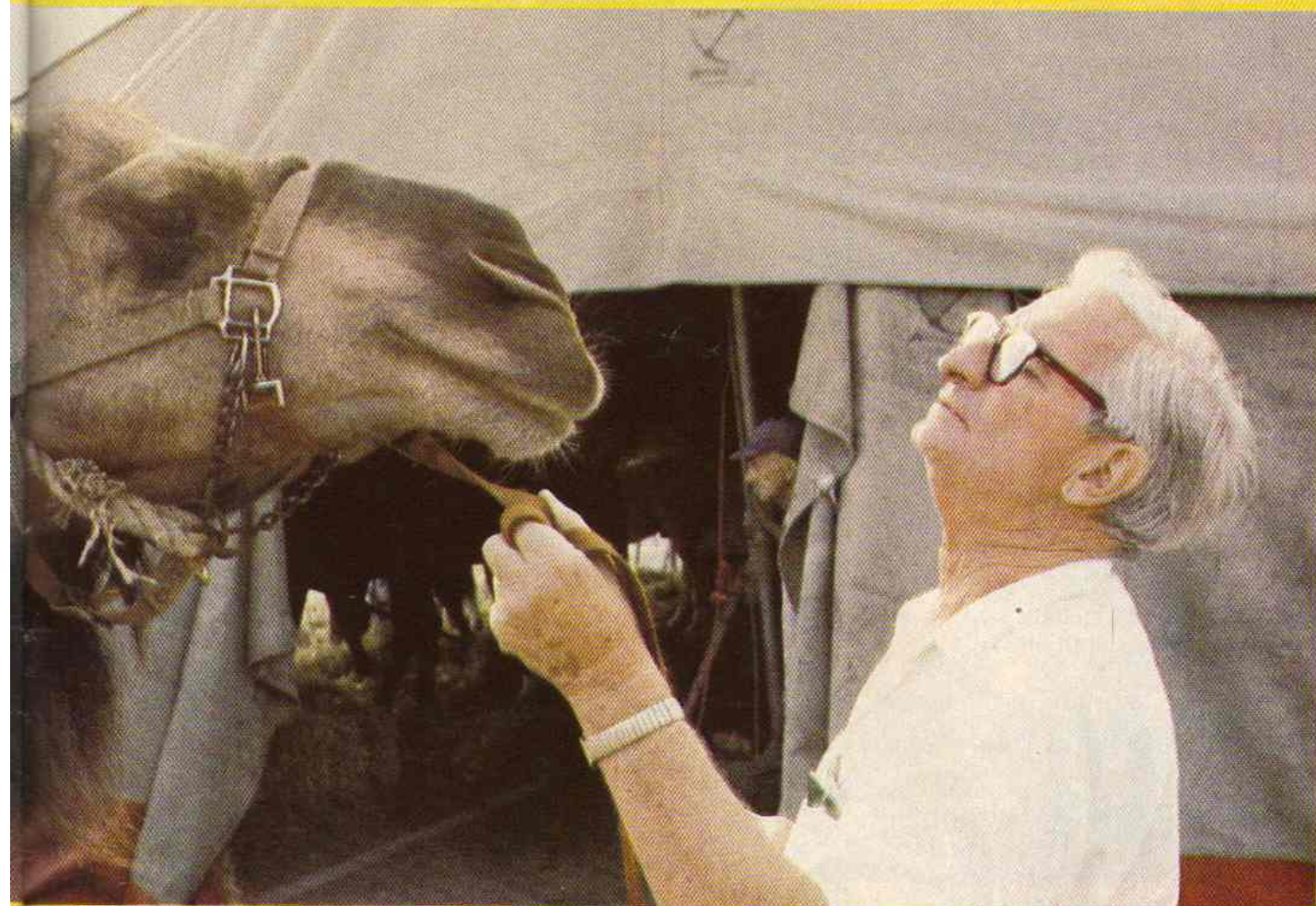
by April Koral

Right: Who takes care of a circus elephant? Well, trainers handle feeding and simple problems. But . . .

Below: If an elephant's tusk loosens up, or if it has corns on its huge feet, Doc Henderson is the one who comes to the rescue.



DOC ON EARTH



How do you take a tiger's temperature? Where do you find an elephant's pulse? What can you do for a lion with a toothache?

You may not know the answers to those questions, but J.Y. "Doc" Henderson does. He's the veterinarian (animal doctor) for "The Greatest Show on Earth"—Ringling Brothers and Barnum & Bailey Circus.

So how do you take care of 140 different animals? Verrrry carefully. "You have to watch out. They can kill you or take your arm off," says Doc. "You can train these animals, but you can never completely tame them."

Tigers and leopards look like pussycats when famous trainer Gunther Gebel-Williams works with them, but backstage they're wild animals. Doc learned that right after he joined the circus.

Above: Doc Henderson, circus vet for 37 years, examines a camel's teeth. Doc also cares for 20 elephants, 42 horses, 20 chimps, and 45 lions, tigers and leopards!

A Leopard Says 'Hello'

"The first week I was on the job, a black leopard greeted me with his paw," Doc recalls. He points to the scar under his chin. "Since then I've been pushed by horses and spat on by a llama. But that leopard's 'hello' was the only time I got hurt. I learned to be more careful."

Doc has been the circus's vet for 37 years. But he didn't start out working with lions and tigers. After graduating from a school for vets, he opened up an office in Louisiana in 1937. There,

he treated mostly horses and cattle. One day, he got a call from Ringling Brothers. "When I was offered the job with the circus," he says with a laugh, "I didn't know the difference between a hippopotamus and a giraffe."

Circus life was tougher back then. Today, the show stays in one place for a number of days. But in the 1940s, the circus moved to a different town every night. "We would finish the evening show and load all the animals onto the train at 11 o'clock at night," Doc remembers. "Then we would travel until 11 o'clock the next morning, unload, and do another show. It was very hard on the animals. The only time they got to sleep was between shows during the day."

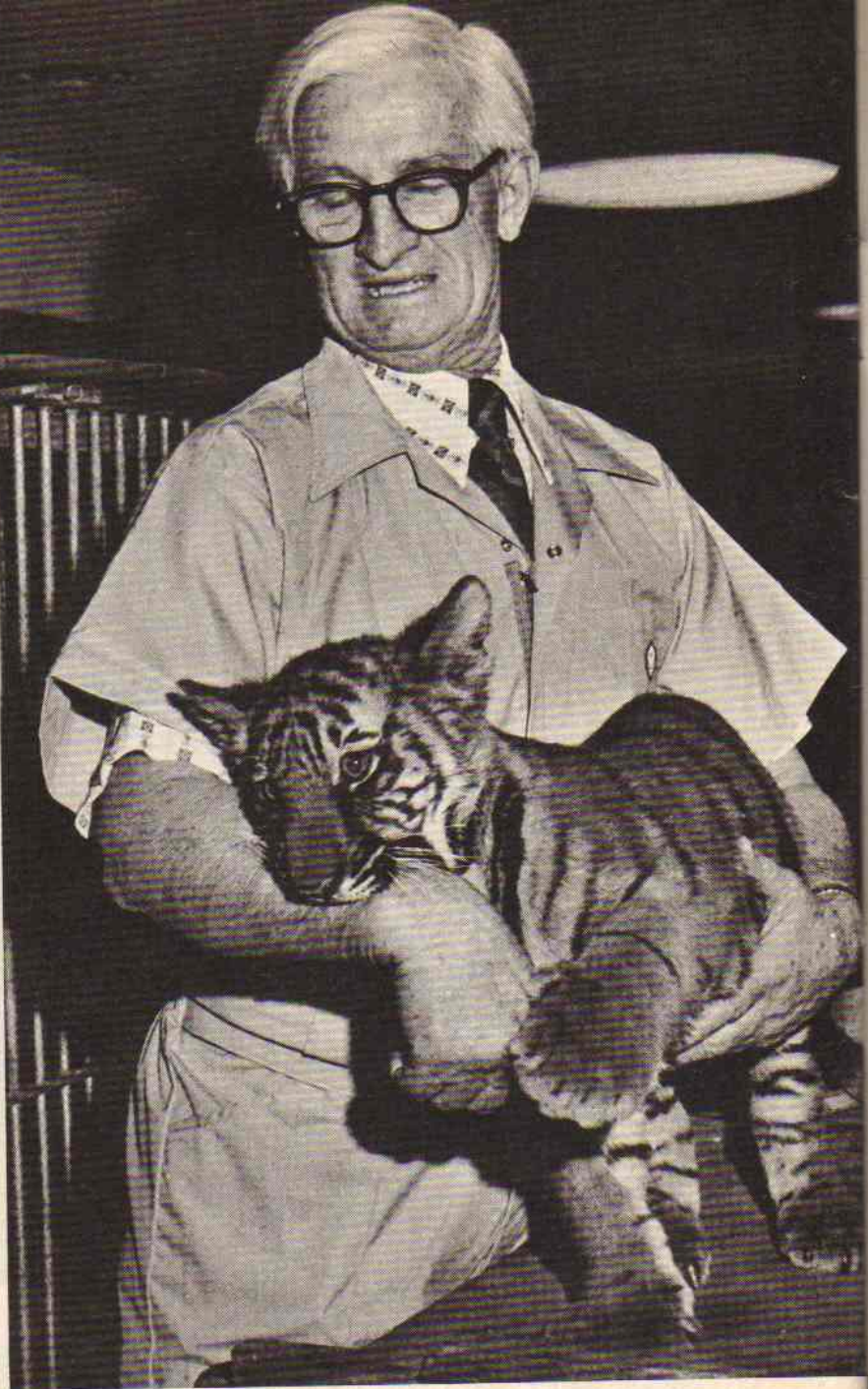
When animals got sick, there wasn't a lot that he could do for them. "There was no penicillin or antibiotics to help treat diseases," Doc explains. "And we didn't have tranquilizers to calm the animals down. In the beginning, before I'd go to work on an animal, I did a lot of praying."

How Do You Check A Horse's Tonsils?

Today, Doc has dozens of modern medicines to choose from. He also has every instrument your family doctor does, plus a few you wouldn't believe. There is a knife he uses to slice corns off an elephant's soles. "It's like cutting a hunk of cheese," he says. He's got an extra-large set of files in case an elephant needs a manicure. When he wants to check a horse's tonsils, Doc uses a tool that keeps the mouth open, called a speculum. And when a horse's tooth grows too long, he uses a special saw to cut it.

There are other differences between caring for people and animals. When you go to the doctor, she probably takes your pulse at your wrist. Doc takes an elephant's pulse from the back of the elephant's ear!

Doc must watch the animals very carefully for special signs of trouble.



"If a tiger is eating on just one side of his mouth, he probably has a loose tooth," he says.

And how do you take care of a tiger's loose tooth? "Pull it," Doc says. So he gives the tiger a tranquilizer and puts it to sleep for a little while. That's the way almost all operations or treatments are done. Some vets put animals in a cage which is so small that the animal can't move. Doc doesn't like to do this. "The animal fights so hard when it is put into it, it loses a lot of strength. That's not good when it's sick."

(turn to page 44)

Above: A baby tiger gets a little taste of its doctor's arm. All the circus "cats" are given meat with extra vitamins and minerals added. One day a week, they don't get fed at all. "It's good for them,"

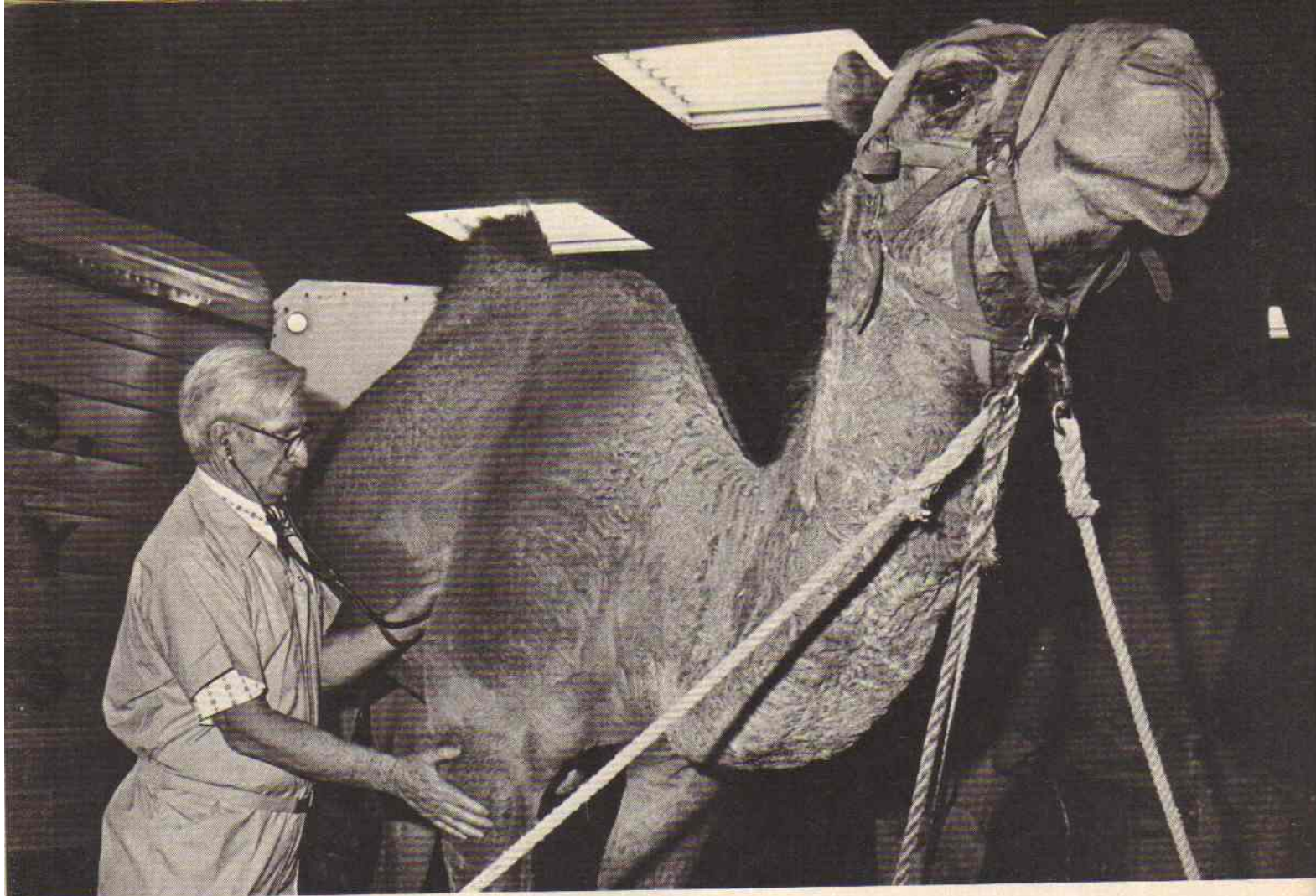
Doc says. "It empties out their stomachs."



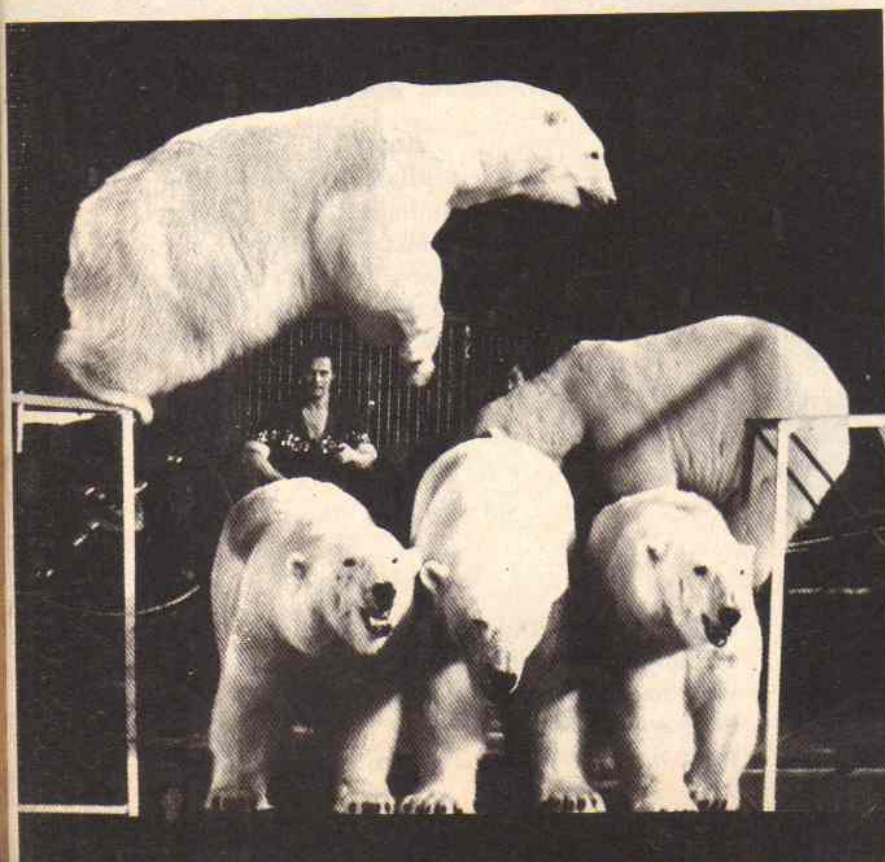
Above: Gunther Gebel-Williams, famous Ringling Bros. animal trainer, can make wild leopards jump over burning torches. "You can train these animals," says Doc, "but you can never really tame them."



Left: What does Doc do for a chimp with a cold? "I give it some medicine mixed in a teaspoon of vanilla or strawberry-flavored water," he says.



Above: How much do the animals eat? Here's a day's shopping list: 200 pounds of meat, 3,000 pounds of hay, 250 pounds of molasses and grain, 100 pounds of oats, 50 pounds of carrots and 45 loaves of bread. Wow!



A 24-Hour-A-Day Job

While the circus animals perform, Doc spends most of his time backstage sitting in a brightly painted van. Though things seem calm, he knows there can be an emergency at any time—day or night. He recently had to help a giraffe who was trying to give birth. Her baby was coming out backwards. "It took me 30 minutes of hard work until I finally turned that baby around," he says proudly.

If you're an animal lover, you might think Doc Henderson has the perfect job. But he has found one disadvantage. "The hardest thing," he says, "is not to get attached to too many of the animals." With 140 of them waiting for his care, the doctor can't play favorites.

Left: Even polar bears get into the act. "Things are better than they used to be for circus animals," says Doc. "We've got strong new medicines to treat them better."

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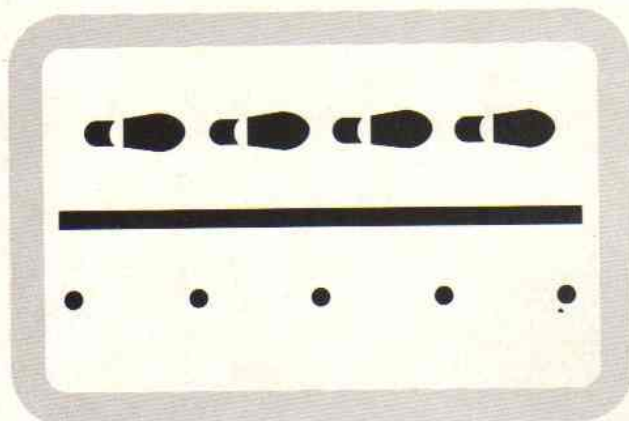
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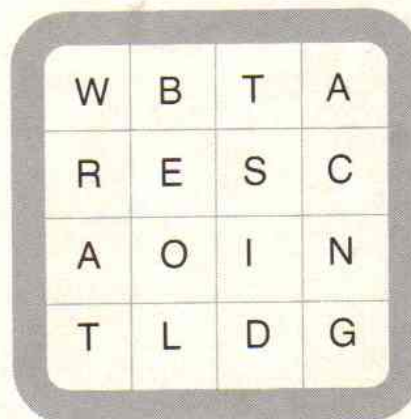
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Do It!

1. Suppose you found these tracks on some damp ground. Would you be able to figure out how they were made and by whom?



2. How many words about the circus can you make from the letters in these boxes? See if you can find at least 10 of them.



Answers
Below

Next Month!

Here's a sample of what you will find in the next issue of 3-2-1 CONTACT:

Space Colonies

A look at outer-space cities of the future.

Special Section

16 pages of games and puzzles to use with our new TV show.

Codes

Learn how to read and write secret languages.

Plus: Factoids, experiments, animal cards and lots more.

Credits

COVER: STAR WARS/COURTESY TWENTIETH CENTURY FOX; LEOPARD/COURTESY RINGLING BROS. AND BARNUM & BAILEY CIRCUS; **P. 4:** PHOTO/MOVIE STAR NEWS; **P. 5, LEFT:** PHOTO/COURTESY COLUMBIA PICTURES; **P. 5, RIGHT:** PHOTO/COURTESY NASA; **P. 6, TOP:** PHOTOS/COURTESY TWENTIETH CENTURY FOX; **P. 6, BOTTOM:** PHOTO/COURTESY NASA; **P. 7, BOTTOM:** PHOTO/COURTESY UNIVERSAL; **P. 7, TOP:** PHOTO/©LONDON FILMS; **P. 8, TOP:** PHOTO/COURTESY UNITED ARTISTS; **P. 8, BOTTOM:** PHOTOS/©IVAN PINTAR; **P. 9-11:** ILLUSTRATION/©JERRY PINKNEY; **P. 12-13:** ILLUSTRATION/©MALLORY CALLAN; **P. 14-15:** ILLUSTRATION/©TRACY GARNER; **P. 16, 33:** ILLUSTRATION/©MAXIE CHAMBLISS; **P. 18-21:** ILLUSTRATION/©RICHARD BROWN; **P. 22-23:** ILLUSTRATION/©DANIEL PELAVIN; **P. 24-27:** ILLUSTRATION/©ROBERT DENNIS; **P. 34-35:** ILLUSTRATION/©KATHY DEETER; **P. 36-39:** ILLUSTRATION/©SUSAN GRAY; **P. 40-44:** PHOTOS/COURTESY RINGLING BROS. AND BARNUM & BAILEY CIRCUS; **P. 48:** ILLUSTRATION/©BOB LARKIN.

Thank You!

Thanks to the teachers and children from the following schools for their help: Guggenheim Elementary and Carrie P. Weber Junior High Schools in Port Washington, N.Y.; Stillman Elementary and Tenafly Middle Schools in Tenafly, New Jersey; and The Riverside School in New York City. Also, thanks to the Greenwich YWCA and the Iona College Summer Day Camps.

- ANSWERS**
1. A man with a wooden leg pushing a wheelbarrow.
2. acrobat, band, cage, dancer, giant, lion, seal, tiger, tent, ring, tent, dogs, clown, lion, seal, tiger.

Did It!

Skyfacts: Pluto

Each month SKYWATCH will bring you a close-up look at another planet, moon or sun. Clip these pages and save them in a notebook. At the end of the year, you will have your own guide to the solar system.



Symbol: Pluto's sign (at left) is made from the letters P and L. They stand for scientist Percival Lowell. He began the search that led to the discovery of Pluto.

Atmosphere: It is too cold on Pluto for an atmosphere to exist. Any gas that would be in the air would freeze.



Size: Pluto's equator measures 5,650 miles (9,090 km.) around. That's a little more than one fifth the size of Earth.

Surface: It is so far away that scientists know little about Pluto's surface. They think the planet is covered with ice made of frozen methane gas.



Day: One day on Pluto is about six and a half Earth days long.

Year: It takes Pluto 248 Earth years to orbit the sun. That's a long time between birthdays!

Moons: Pluto has at least one moon, named Charon (SHA-ron). It was first seen on June 22, 1978, by a scientist looking at photographs of Pluto.



Temperature: Pluto is so far from the sun that it is always much colder there than on Earth. The temperature is about minus 388°F (-233°C).

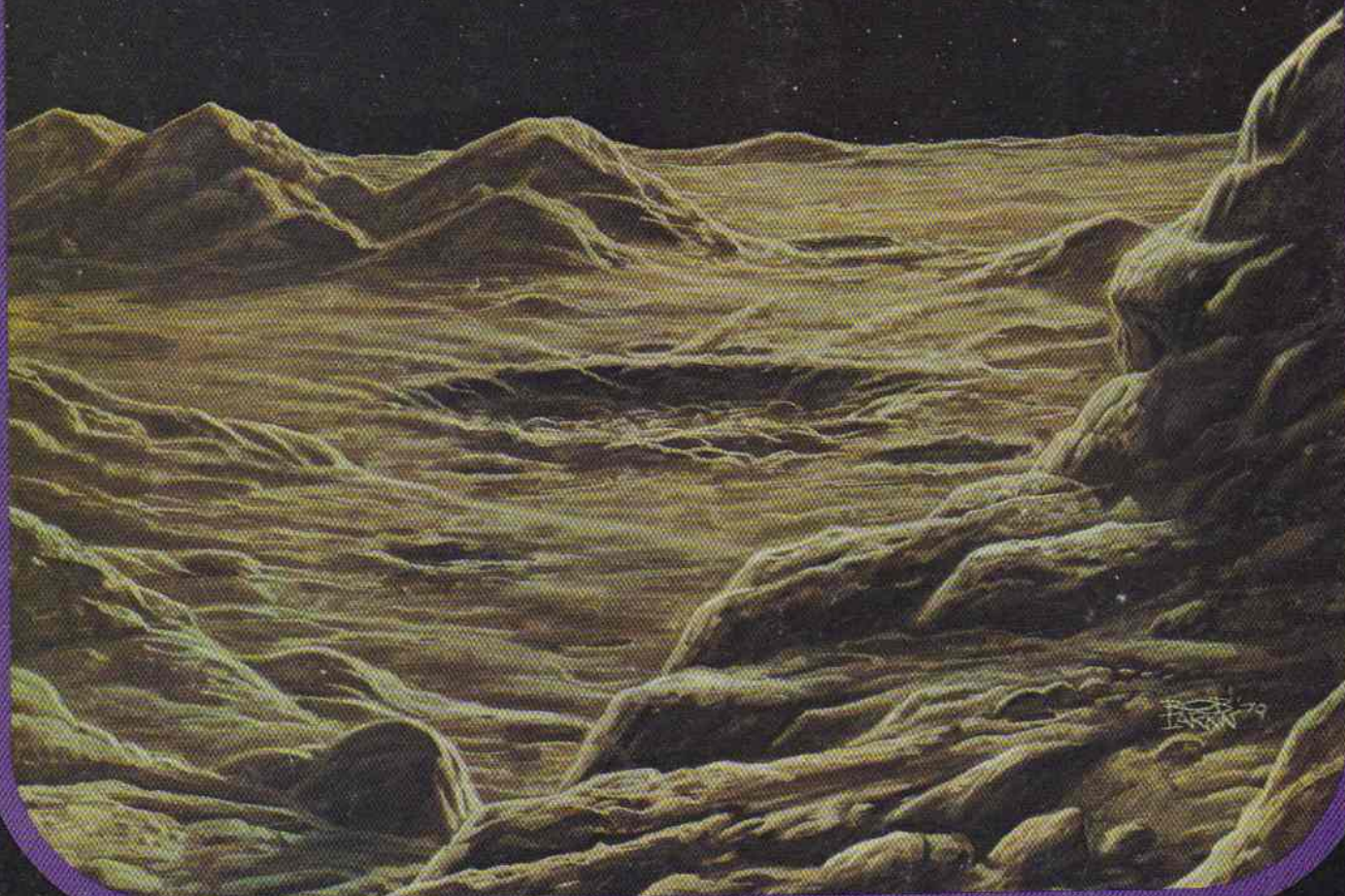
You on Pluto: No one knows for sure how much you would weigh on Pluto. But if you weigh 75 pounds (34 kg.) on Earth, you would weigh 38 pounds (17 kg.) or less on Pluto.



Early theories: Scientists began searching for Pluto in 1905. They thought that a ninth planet was changing the orbit of the planet Uranus. Scientists thought the problem was solved when Clyde Tombaugh (TOM-boh) discovered Pluto in 1930. We now know that Pluto is too small to have affected Uranus' orbit. Its discovery was an accident.

Modern theories: It is possible that Pluto was once a moon of Neptune that broke away from its gravity. This could explain why Neptune and Pluto are the only planets whose paths cross. Because of that, Pluto has been the eighth planet from the sun since January, 1979. In March, 1999, it will become the ninth planet again.

Skywatch



Above: The bright star you see from Pluto is the sun.

Focus on Pluto, the last planet to be discovered.

Pluto was first seen in 1930. The smallest planet, it is 3 billion miles ($4\frac{1}{2}$ billion km.) away from the sun. If you were standing on Pluto, the sun would look like an ordinary star. Pluto is so far into deep, dark space, that it was named for the ancient god of darkness.

PLUTO



EARTH



SUN



The size of Pluto, compared
to the Earth and Sun.

Skysight

Only a few scientists can see Pluto. That's because you need a very powerful telescope to see it.

(continued on
page 47)